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REVISED EDITION

PRICE 10 CENTS

# VEGETABLES FOR THE HOME GARDEN

PUBLISHED BY
W. ATLEE BURPEE & CO.
PHILADELPHIA

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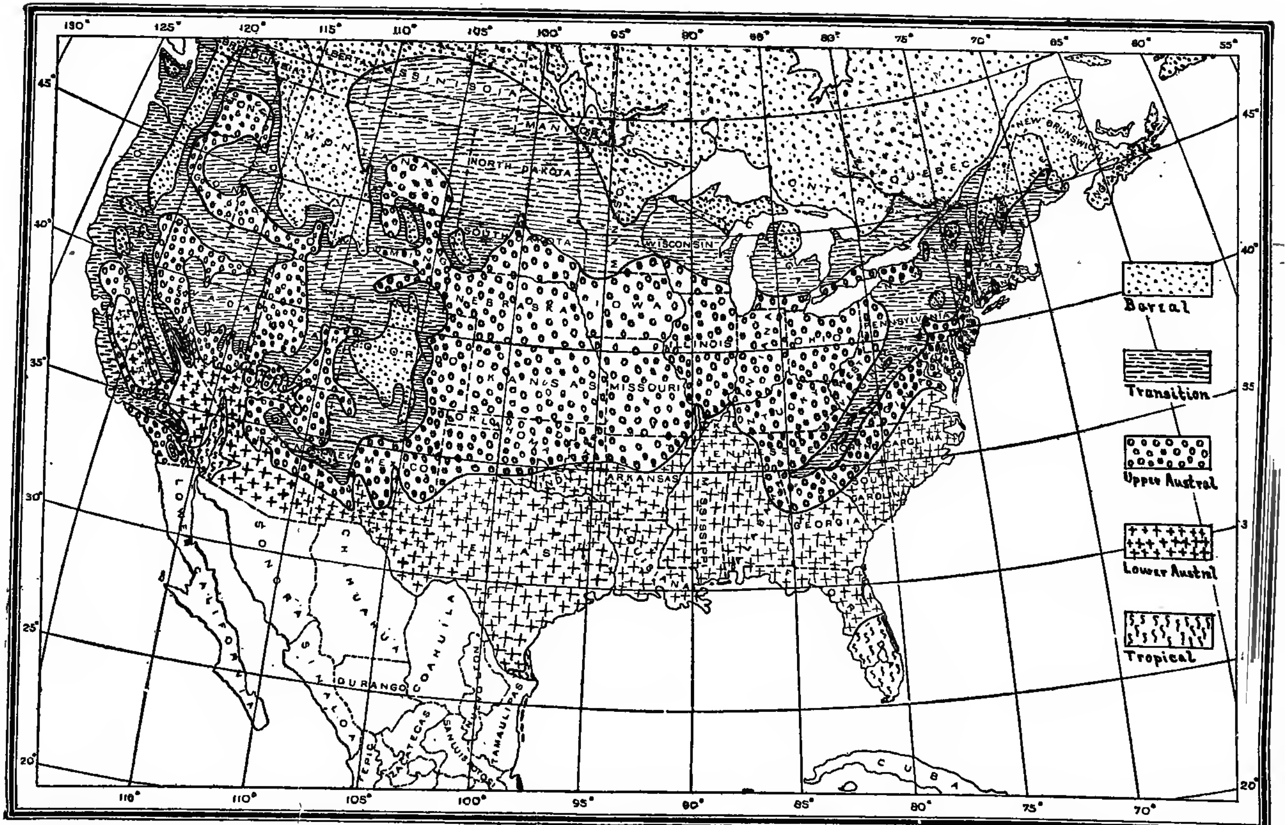
FOR THE

# HOME GARDEN.



MAP SHOWING LIFE ZONES OF THE UNITED STATES. (*Loaned by the United States Department of Agriculture.*)

# VEGETABLES

FOR THE

# HOME GARDEN.

COMPILED BY
W. ATLEE BURPEE & CO.

REVISED EDITION.

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WM. F. FELL COMPANY
ELECTROTYPERS AND PRINTERS
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PHILADELPHIA, PA.

# PREFACE TO REVISED EDITION.

VEGETABLES FOR THE HOME GARDEN was first published in 1896, and while originally intended for the amateur or novice it has also had a wide circulation among professional gardeners and truckers.

The text of the revised edition is practically the same, but naturally some changes were necessary as to selection of varieties; although while improved as to "quality of stock," many varieties considered as standard fifteen years ago are just as popular as ever.

Occasionally the inexperienced planter may without a guide-book of any kind be fairly successful in obtaining a bountiful supply of fresh vegetables, but our experience in handling a large correspondence is that there is a place for a handy manual giving in easily understood language the best methods of cultivation.

W. ATLEE BURPEE & CO.

Revised at *Fordhook Farms,* July, 1911.

# VEGETABLES FOR THE HOME GARDEN.

## PART I.

### LOCATION AND SOIL.

If there is any choice in the selection of location, choose level land or that having a southerly or southeasterly slope.

High hills or woodlands on the north and west are an advantage at once recognized by the professional gardener, since the protection they afford permits operations to begin a week or two earlier than on lands where no natural shelters prevail.

For earliness, a warm sandy loam is to be preferred, but for the general purposes of a home garden a rich, well drained loam, neither sandy nor clayey, is the ideal type of soil. The richest natural soils contain clay, sand, lime, and organic matters in due proportion, but these are only to be found in a few favored localities.

Whatever the location and the character of the soil, a square or a parallelogram is the most conveniently shaped plot for garden operations.

**Sandy Soils.**—Sandy soils are early but ordinarily they lack fertility and that absorptive power for moisture essential to prolonged growth. We may render them capable of absorbing and retaining moisture, carbonic acid, and all essential plant nutrients in two ways: *First*, by mixing clay, which has this power, with the light sand, and adding humus materials, like marsh mud, muck, or peat; and, *second*, by the use of land plaster, wood ashes, and marls, which increase their capacity for absorbing moisture and exert a binding influence on sands, just as lime and sand when mixed with water make mortar. Such lands are dressed with land plaster, marl or wood-ashes, muck, marsh mud, etc., and clover or other leguminous crops are sown, which in turn are plowed under for the purpose of growing more valuable crops. For binding sandy and even drift soils, and for enriching them, red and crimson clover, cow peas, spurrey, vetches, etc., are most valuable.

If a sandy soil is underlaid with clay at no great depth it may be dug up and thrown in small heaps or exposed in narrow ridges for a year or more to the action of the atmosphere, or the clay may be dug out from some convenient clay pit and permitted to weather for a year before use ; then it should be scattered over the surface of the sand. By continuing this treatment, and turning under green crops, the soil in a few years will be completely changed, and waste sands converted into rich garden mold.

Such work is necessarily laborious, but it can be done at seasons when no other farm work is possible ; it is both practical and profitable, and will repay the gardener for all his expenditure of time and labor.

**Clay Soils.**—Soils in which clay predominates unless provided with good drainage, which is rarely the case, are wet and cold, and cannot be worked so early in the spring as those of a loamy or a sandy character. If such soils have good natural or artificial drainage their tilth may be further improved by a light covering of sand applied to the surface. In the case of the family garden this is a matter of small expense, and the addition of fine, gritty sand will produce an astonishing improvement in the productiveness of the land.

## DRAINAGE.

A stiff, cold, and wet clay is quickly and permanently improved by drainage. In the field or garden, drainage does for the land what the hole in the bottom of the flower-pot does for the soil contained within it. It provides an outlet for surplus water, and a means of ingress for the air. Without this means of escape superfluous moisture would accumulate in the pot, no air would be admitted to the earth, and the water would become stagnant, rendering the soil unfit for the plant to thrive or even live in.

By drainage the soil is rendered less cold and moist, aëration takes place, the land becomes warmer, is better able to retain heat, and evaporation at the surface, which is continuously cooling off the surface soil, is greatly reduced. A drained garden or field is not only warmer but is in a better physical or mechanical condition for retaining warmth, and consequently it admits of earlier cultivation. Another important advantage of drainage is that on the approach of cold weather plants are less liable to be killed or thrown out of the ground by freezing. Well-drained, deeply tilled soils will, also, stand drought much better, for being relieved of redundant moisture, the roots of plants penetrate freely to greater depths. In the early period of growth there is a rapid development of the root-system, and if too much moisture is present at this time, a vigorous extension of these organs is checked and growth confined to the upper soil. In case of drought later in the season plants will not be able to reach down through the soil for food and moisture. In a well-drained and properly tilled soil a crop does not suffer from an impaired root system, nor is the soil so deficient in moisture in dry seasons. Drainage permits free access of air to the soil, without which the nitric bacteria,—the microscopic organisms which are the cause of nitrification,—are inactive, for these invisible agents of fertility cannot perform their life functions in a cold, water-laden soil.

Soils differ greatly in their capacities for holding water. The water-holding capacity of a soil is the amount of water that a given weight of soil will contain when all the air spaces between the grains of soil are filled with water. The water-holding capacity of a heavy clay soil is about 44⅕ pounds of water in 100 pounds of soil; a good wheat soil, when fully saturated, will contain about 31½ pounds of water, and a very sandy soil under the same conditions will hold about 20 pounds of water. When the water in a soil amounts to 80 per cent. or more of its water-holding capacity, the soil conditions are detrimental to plant-growth. Ordinarily, plants thrive best when the water in soils amounts to from 40 to 60 per cent. of their water-holding capacity.

Drainage is effected by opening trenches in the surface, or by covered drains. Open drains are useful at times, but they are liable to serious objections, and are much less desirable than covered ones. Covered drains are more economical, last longer, do not interfere with cultivation, or occupy space that might be more profitably used for growing crops. Underdrains may be constructed of stones or of porous tiles made specially for the purpose, or even of boards. We say nothing here of the old-fashioned brush drains, for in this age no farmer or gardener can afford to waste his time constructing such clumsy and worthless affairs. Even the stone drain is cumbersome and expensive to construct, and wherever tiles can be had, the cost of construction is less, better drainage is obtained, the drain lasts longer, and is less liable to get stopped up. To lay a stone drain a large trench must be dug, involving much labor unnecessary in laying tiles. The trench for tiles may be narrow, a foot or a foot and a half at the top, and half or less than half that width at the bottom.

The fall should not be less than one inch to the rod, and the distance apart will vary from 15 to 20 feet in very wet, retentive soils, to from 25 to 40 feet, or even greater distances, according to the character of the soil to be drained. Ordinarily, drains should be laid at a depth of from three to four feet from the surface.

**Stone Drains.**—If the stones are flat the drain should have an orifice at the bottom, carefully covered to prevent the earth from passing through and clogging up the passage. If round stones are used, a "rubble" drain will then have to be constructed. This is made by filling in the bottom of the trench with stones to a depth of from 12 to 16 inches, and covering with inverted sods or a thick covering of straw to prevent the soil washing through.

**Wooden Drains.**—For small gardens, triangular-shaped wooden drains are sometimes built, and if well constructed, will last from fifteen to twenty-five years. Spruce, pine, or hemlock boards are ripped up into strips four inches in width, and three pieces are nailed together to form a triangular-shaped pipe. In putting the sections of drain together care must be taken to "break" the joints, and also, to nail the strips rather loosely together; if the nails are too close together the swelling of the boards in the wet ground may prevent the water from entering the drain. Sound pine, hemlock, or spruce boards answer admirably for such drains, or in regions where the common yellow locust (*Robinia pseudacacia*) is indigenous, the wood of this tree may be used. Drains constructed of yellow locust will frequently last a lifetime.

**Tile Drains.**—Porous tiles are now to be had at reasonable cost in all large cities, so that there is little reason for constructing stone or wooden drains except in remote districts, where the cost of tile is prohibitive. The round and horse-shoe tile are both in use, but the latter seems to be the more popular with gardeners. Whichever is selected, for the garden the lateral drains may be of two or three inch tiles, placed from 15 to 20 feet apart in very wet, retentive soils; in more porous soils the distance may be from 25 to 40 feet, or even a greater distance. The main drains should be from four to five inches in diameter.

## MANURING.

**Stable Manure.**—Whatever the character of the soil, a goodly quantity of stable manure should be used, and this the writer prefers to apply late in the fall. In large gardens it may be plowed under, but in smaller ones, if not convenient to spade in, the manure may lie on the surface through the winter. If the garden soil is of a stiff, clayey nature, plowing or spading should not be done when the ground is very wet.

A dressing of stable manure should be applied every year, although the practice of alternating with a high grade, complete fertilizer is practiced by many market gardeners. A better plan is to use each season both stable manure and commercial fertilizer. About every third or fourth year a light dressing of air-slacked lime may be advantageously applied. From two and one-half to five pounds of air-slacked lime to each 100 square feet of surface will be sufficient.

**Composts.**—All refuse materials not consumed by stock and poultry should be gathered together in a sheltered but convenient spot and composted with sods, soil, straw, leaves, etc., interstratified with sufficient stable manure to bring about moderately rapid decomposition; night soil, poultry manure, and the wash-water and slops from the house may also be added. As the heap progresses, land-plaster, bone meal, wood-ashes, and a little air-slacked lime may be dusted over the surface. When a height of about five feet is attained the writer's practice is to cover the heap with a light layer of soil, after which the top and sides are sown with clover, rape, or turnips, and a new compost is begun. Wherever crimson clover is grown it serves admirably for covering composts, but the common red or white Dutch clovers, turnips, sand vetches, or cow peas will do equally well. But rye should never be sown on a compost, for it will pump out the water and leave the heap as dry as punk.

The growth of these plants shades the compost from the light, which is not favorable to nitrification, and they act as a mulch, helping to retain the moisture, which must be maintained even, if necessary, by throwing a few pails of water over the pile in midsummer.

The growth on the compost thus serves a useful purpose, shading it from the hot summer sun and covering with a growth of bright green what in too many gardens is an unsightly pile of rubbish. If clover, vetches, or cow peas are used, these plants are busily at work manufacturing the very best kind of food for garden crops.

For use in the garden there is no necessity to be continuously turning composts, as many writers advise. During the summer the refuse materials may be deposited in some convenient spot, and in autumn the compost may be built by gathering up all the refuse products of the garden and composting them with leaves, straw, sods, coal-ashes, etc. Place the materials in layers about a foot thick, and between each layer spread a course of strawy manure six inches thick. A little land plaster may be sprinkled over the manure, and wood-ashes or air-slacked lime dusted over the other materials. Bone meal may also be used, and where such materials are to be had as kainit, fine-ground South Carolina rock (floats), castor pomace, cotton-seed, etc., these form excellent additions to composts.

Made in the fall, composts may be turned over in the spring, the materials intimately mixed, and the clover or other seed sown.

In the following fall the heap may again be thrown over and used.

**Concentrated Manures.**—It is often desirable to apply commercial fertilizers, bone meal, wood-ashes, etc., to small gardens and lawns, and the question arises, how much of these materials shall we use? A thousand pounds per acre of concentrated chemical manure is never too much, and it is a convenient quantity to use as a basis for estimates in fertilizing fractional parts of an acre. At this rate per acre, we use approximately two and one-quarter pounds of fertilizer to each 100 square feet of soil; the quantity in pounds to use at this rate on any sized plot of ground may be readily ascertained by finding the area in square feet, which is then multiplied by 2¼ and divided by 100, which gives the number of pounds required.

For example:—

Suppose we have a lawn or garden 30 steps wide by 60 steps long,—we estimate each step at one yard, or three feet. We have then,

$$
\begin{array}{r l}
90 \text{ ft.} \times 180 \text{ ft.} = 16{,}200 & \text{sq. ft.} \\
2\tfrac{1}{4} & \\
\hline
32{,}400 & \\
4{,}050 & \\
\hline
100\overline{)36{,}450}\big( & 364\tfrac{1}{2} \text{ lbs., the quantity of fertilizer to use,}
\end{array}
$$

or 16,200 square feet × 2¼ = 36,450 ÷ 100 = 364½ pounds.

Or, suppose we have a small suburban home plot, 20 by 40 feet, which we wish to give a top dressing of bone meal, wood-ashes, or commercial fertilizer:—

20 feet × 40 feet = 800 square feet × 2¼ = 1800 ÷ 100 = 18 pounds.

If we wish to use fertilizers at the rate of 2000 or 3000 pounds to the acre, as many market gardeners do, we use twice or three times the quantity thus ascertained.

An acre contains 43,560 square feet, or 6,272,640 square inches: It will take nearly 900 pounds of fertilizer to the acre to furnish one grain of fertilizer to each square inch of soil. There are 7000 grains in a pound, so that if the fertilizer were evenly distributed, which is never the case in common practice, there would be spread on each square inch of surface but the one seven-thousandth part of a pound. It will thus be seen that a quantity of fertilizer far in excess of the average application made by farmers in this country, if evenly spread over the soil-surface and then distributed by culture or conveyed by water evenly through one foot in depth of the upper soil, must form but an infinitesimal part of the soil medium through which the roots of plants must forage in their search for food.

## HOTBEDS AND COLD FRAMES.

It is best to locate these on the sunny side of a barnyard wall, against a building or high fence that will afford protection from the north wind.

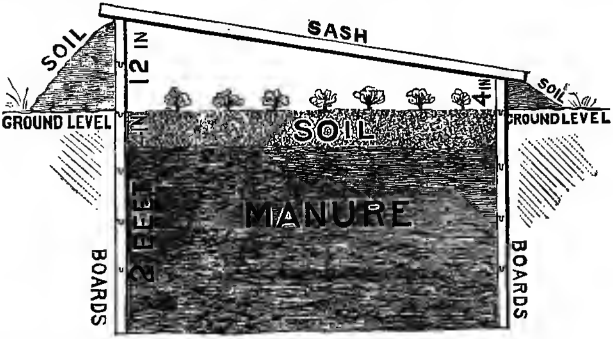

Fig. 1.—Illustration Showing the Manner of Making the Hotbed when Sunk below the Surface of the Ground.

They should be located near the manure pile, and convenient to water, but on well-drained land. The sashes can be bought ready painted and glazed in most cities much more cheaply than they can be made in small establishments. The standard-size sashes are three and a quarter feet wide by six feet long, and are one and a half to two inches in thickness. If stored under cover and in a dry place when not in use, and if given an occasional coat of paint, they will last a lifetime. So little do sashes now cost that every family garden should be abundantly provided with them;—from three to six sashes will be enough for a garden of one acre.

**The Hotbed.**—In making a hotbed, dig a trench facing the south or southeast a few inches short of six feet wide, or as wide as the sashes will cover conveniently, about two feet deep, and as long as the hotbed is to be. This trench is then to be boarded up with sound planed or rough boards. The north side of the frame should be six or eight inches higher than the front, so that rain will quickly run off the sashes (see Fig. 1). The plants will also receive more sunlight if the sashes are at an angle than if placed horizontally over the bed.

The outside of the frame above soil-level should be well banked up, when in use, with coarse manure, straw, or litter, which will help to retain warmth and shed rain. Or, if there is plenty of fresh stable manure, the hotbed may be made as in Fig. 2. Cord the manure as in the illustration, two feet high, and a foot wider than the sash frame on all sides; when the frame has been set in position on the heap, the manure should be piled up on the outside nearly to the top of the boards, making a warm jacket for the plants within. A portable frame of boards may be made of any desired size for the sash to rest on; it should be twelve inches high at the back and eight inches high in front.

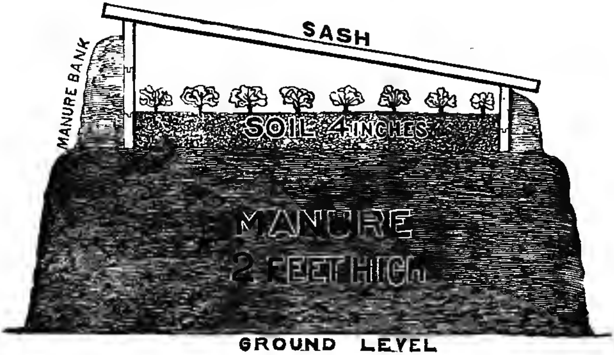

FIG. 2.—ILLUSTRATION SHOWING THE MANNER OF CONSTRUCTING A HOTBED ABOVE THE SURFACE OF THE GROUND.

This style of bed does away with any digging and secures good drainage; the frame can be put away as soon as the plants are removed to the garden, and the manure, which has become well rotted by this time, provides excellent compost for any late-planted crop.

## PREPARATION AND PLANTING.

The manure which is to produce the heat for a hotbed should be thoroughly forked over about a week or ten days before the bed is started; while a large proportion of the contents should be fresh horse manure, straw, leaves, or any rapidly decaying litter may be added to increase bulk and generate heat. When the materials have been mixed and heaped solidly together, sprinkling with hot water will hasten the fermentation. In about a week, when the heat has gone down to 95° or 100° F., the manure should be placed in the bed and well trampled down; it should come up to within eight inches of the top of the frame and be covered with three-and-a-half or four inches of fine, rich soil. A good plan is to use earth sifted through a coal sieve, by which means a fine, friable seed-bed is provided.

Place the sashes in position as soon as the manure and soil are thus prepared. An increase of heat will result from the repacking of the manure, and the bed will be too warm for planting, but the heat generated will destroy many weed seeds in the soil; the vapors and gases arising from the fermenting manure will be absorbed by the soil-cover which is to be the seed-bed. Sometimes there is a violent fermentation and a rise in temperature to 115° to 120° F. In such cases the sash should be slightly raised for a day or two. Always have a good thermometer at hand, and insert it into the soil every day. When the temperature has subsided to 90° F., planting may begin.

Finer and stockier plants will be produced if the seed is sown in drills about six inches apart and covered with soil to a depth of about five times the diameter of the seed. The young plants must have a uniform degree of heat and moisture from the time they appear above ground until the time draws near for transplanting out-doors.

**Hardening Off.**—As the time approaches for planting out the plants must be "hardened off," that is, they must be made hardy by exposure to the outside air, whenever the weather will permit. By this treatment, and by gradually withholding water, they become more sturdy and when transplanted to the open garden do not suffer from want of the protecting sash.

**Shades.**—Plant-bed cloth is the best material for this purpose, although light frames made of laths answer quite well. The laths should be tacked parallel to each other, from one to three inches apart, and extend across the frames in such a manner as to run north and south when the shade is in position. Plant-bed cloth has a decided advantage in that it may be used also as a substitute for glass, both for hotbeds and cold frames.

**Straw Mats.**—As a protection from frost on cold nights and during severe weather of early Spring, wooden shutters or straw mats should be provided. Shutters one-half inch thick and the size of the sashes, made of any light wood, will do, but straw mats are decidedly better and much cheaper. With reasonable care these mats will last four or five years. They may be made at home during winter or on rainy days.

**Making Straw Mats.**—A rectangular frame of any desired dimensions for making the mats may be quickly constructed of stout boards. If the sashes to be covered are six feet long the mats should be at least one foot longer, so as to lap over the top and bottom edges which are the points where frost is most liable to enter.

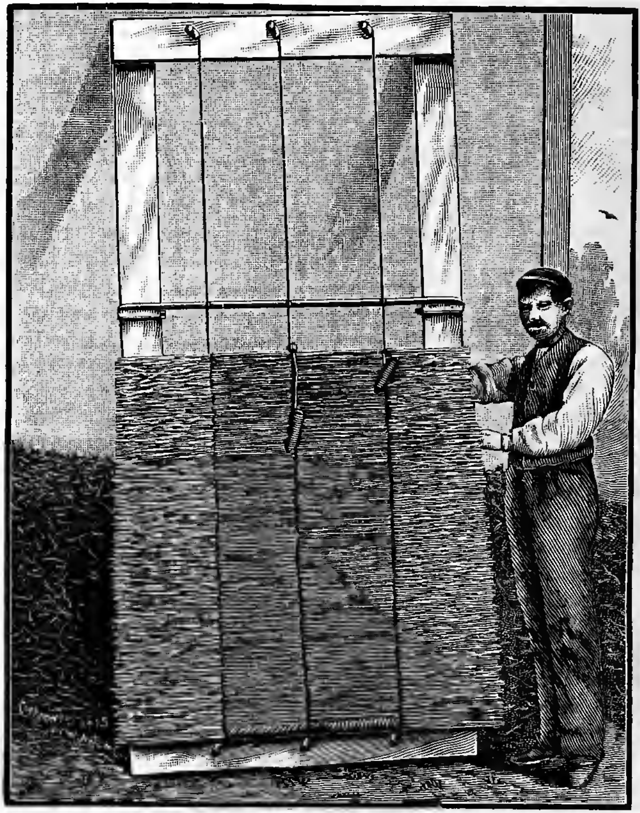

FIG. 3.—MAKING STRAW MAT. (*From a Photograph at* FORDHOOK FARMS.)

To make a secure frame for mats seven feet long, take for the longer sides stout boards eight feet in length ; to these nail a top and bottom cross-piece three feet long, thus providing a rectangular frame eight by three feet. Into the top and bottom boards, which should be two inches thick, drive heavy nails or insert wooden pegs one foot apart. To these supports strong tarred strings, known as "marline," are fastened and stretched tightly from the top to the bottom of the frame, just as the strings of a violin or banjo are strung. Well waxed, heavy twine will do quite well for constructing these warps or "uprights," as the strings are called. At the bottom of each of the uprights lighter tarred or waxed threads are fastened ; these should be twice as long as the frame, and to prevent the threads becoming tangled, they may be rolled on large spools and unwound as the work progresses. The frame may be leaned nearly upright against a wall or placed in a horizontal position, whichever may be most convenient for work.

In knitting the mats use the very best hand-thrashed rye straw ; or, the long wiry sedge grass found growing in many sections makes very good mats. Take about 50 haulms in the left hand, and with the fingers of the right hand comb out all broken straws, so that only straight, unbroken straws are retained. Get the stem ends even by tapping on a board or the floor, and then divide the bundle into two equal parts ; put them together again with one-half of the head or ear ends facing the other half of the stem ends. This is done to make the mat of uniform thickness throughout. The little bundle of straw, held in the left hand, is now laid against the upright strings at the bottom and the center of the bundle pressed tightly down with the thumb of the left hand. The spool of twine is taken in the right hand and the straw secured to the central upright by taking a single turn from right to left around the upright and the straw, making a half knot, which pull as tightly as possibly down on the straw, and press the mesh thus formed flat with the left thumb. The latter manipulation is most essential, for round-shaped meshes are to be avoided. The straw is secured in the same manner to the other uprights and the work continued until the mat is finished. The last layer of straw should be secured with tight, strong knots. Then the overhanging straws from the sides are clipped off and the mat is ready for use. The work is more expeditiously done when two persons are engaged, one making the straw ready, the other laying it on and knitting the mat. Two men, after a little practice, will make a mat in one-hour-and-a-half.

After many years' experience with straw mats, and although realizing the warmth they help to retain within the frames, we have decided that for the amateur or novice the advertised heavy burlap mat is preferable. To those accustomed to making and using straw mats we advise that they continue, but we doubt if the time consumed in the making and after-care of the mats could not be used to better advantage.

Our chief objections to straw mats are that they require a long time to dry out after a heavy rain, and when not in use make really an ideal harbor and nesting place for rats and mice.

The burlap mat advertised in different magazines will confine very nearly as much heat as the one made of woven straw, is more easily handled, dries out more quickly, and if thrown across a barn beam or hung up when not in use does not afford a quiet "nesting place" for rats and mice.

In the tomato-growing section in southern New Jersey neither straw nor burlap mats are used; here it is customary to cover the sash with marsh hay, which is forked on each afternoon and removed the next morning as soon as the sun gets up; and should the day be cloudy and cold, this covering is generally not removed until the temperature rises and there is practically no danger of the young plants being nipped or touched by frost.

If the sashes fit frames tightly, it is remarkable how long well prepared manure will generate heat.

**Cold Frames.**—These are for wintering cabbage, cauliflower, lettuce, etc., and for forwarding them in the spring.

Cold frames are identical in construction with hotbeds except in that they depend for their warmth on the natural heat of the sun instead of artificial heat evolved by fermenting manure. For location select a dry, southern exposure, on well drained land, where no water will stand during winter. Use one-inch boards one foot high at the back and nine inches high in front. Short posts set about four feet apart will keep the sides in position. A cold frame from 12 to 18 feet long by six feet wide will be ample for a large garden.

The soil within should have a dressing of about three inches of well rotted manure, which should be spaded in. If shutters are used, they should be six feet four inches long by three feet wide. These should be raised on mild days to admit air, but sunlight must never be admitted when the ground or plants are frozen. The object of the cold frame is to preserve, not to grow, plants during the winter.

## TRANSPLANTING.

To succeed in transplanting, our plants must be well grown, that is, they must be strong and vigorous, and to obtain thrifty, well-grown plants we must have thorough preparation of the seed bed ; we must also plant at the proper time and in the right manner. If the plants are grown in the hotbed we must not permit them to be crowded by each other, or injured by weeds or insects ; they must not be permitted to suffer from too much or too little moisture, from overheating or cold, or from want of fresh air. In the case of either hotbed plants or those grown in the open ground, they should be let get quite dry for a day or two before transplanting ; but give an abundance of water a few hours before they are removed from the seed bed.

While plants are young they are easily transplanted and there is little loss provided they are carefully removed without injury to the roots ; if set out in rich, mellow soil the check to their growth will be slight, and they will quickly recover.

In removing older plants, especially shrubs and young trees, the utmost care is required to prevent the loss of the small fibrous roots which extend some distance through the soil ; the growth of the stem above ground with its leaves and branches is in proportion to the extent of the roots ; any injury which the latter sustains in transplanting may be counteracted in some measure by trimming off a corresponding portion of the top.

In a normal condition of growth there are only roots enough to provide the nourishment required by the plant, and when a part of the roots are cut off in transplanting the remaining parts cannot furnish sap enough for the whole plant. By removing some of the branches or a part of the top, less sap is required and the remaining roots can supply all the sap necessary for the nourishment of the plant.

## SEED.

There is stored up in every perfect seed a latent germ, the embryo of a new life, the development of which is conditional upon certain natural causes. Moisture, warmth, and exposure to the atmosphere to some extent, are the influences needed to ensure germination and the subsequent growth of the plant. Light is believed to play no part in the process of germination, but on the other hand, it is thought to retard, or at least in some degree to interfere with the vegetative functions. After growth begins the influence of light is most important, and without it the plant makes no progress and soon dies.

The seed must be buried in a properly prepared soil. If put into the ground and loosely covered with light, dry, lumpy soil, the seed does not come in contact with sufficient moisture to soften it throughout, nor is the heat likely to be sufficient, because of too great a circulation of air. If the common practice in seed sowing, of planting without first making fine the soil, is followed, a deficiency of heat and moisture is pretty sure to be the case. Therefore, before sowing, the soil should be made very fine, and the seed lightly covered with fine earth, which should be firmly pressed around it.

If the seed be good and sown at the right time, and the conditions of the season are favorable, the germ soon swells, and a radical shoot or rootlet is sent forth, fixing itself in the soil and beginning a downward growth into the earth ; at the same time a stalk shoots upward towards the light and air in which its leaves unfold. The first root that the plant puts forth does not furnish it with food, but acts as a mechanical support to hold the tender plantlet in place until the feeding roots are formed.

The first or seed-leaves contain the food for the infant plant until its true leaves and roots are formed. The feeding roots are delicate, white, hair-like fibres, so small that the naked eye, unless unusually keen, will not observe them. If the soil has not been made quite fine and pressed firmly around the seed, when these minute roots appear they will have nothing to live upon ; they must come in immediate contact with moisture, and hence the necessity of pressing the soil firmly on the seed bed at the time of sowing. Afterwards in thinning out young plants where the seed has been too thickly sown, the soil should be pressed firmly around the remaining plants. The work of thinning out should not be long deferred, but done before the second pair of leaves are developed.

**Choice of Seed.**—Success in the family garden as well as in general farming, depends in a great measure on the quality of the seed planted.

Soil, climate, and cultivation are factors in modifying results, but perfect seed, fully ripened, in which the germinative power is still unimpaired, produced itself by strong, vigorous plants, is essential even to moderate success in gardening.

It matters not what efforts we have made in the preparation of the soil, if the seed is poor the result will be correspondingly poor, or what is more probable, our efforts will end in complete failure. The value of the garden is in proportion to the good things it yields, and good vegetables can only be obtained by planting vigorous seeds of good varieties, and these cannot be bought cheaply. There is marked difference between seeds grown with the greatest care in order to secure certain esculent properties, and seeds grown merely to sell.

Good seeds cannot be produced cheaply because the causes that combine to make a variety valuable weaken its powers of reproduction. It is a physiological fact that high development in animal and vegetable life is not favorable to rapid or prolific reproduction. Single flowers will be followed by an immense number of seeds, while a perfectly double one is unproductive. The value of a tomato is enhanced by the absence of seed; a fleshy melon has but few seeds, proportionately, so that the cost of growing the seed of either is in proportion to the quantity produced. It, therefore, follows, that the difference in the cost of seeds, or the prices charged for them, truly represents the value or quality of what they will produce.

The expenditure for seed is so small in proportion to the other expenses attending the garden, and to the value of its productions, that the cost of seed should not for a moment be considered.

**Quantity of Seed.**—In the family garden it is often essential to make the most of a limited area. Economy of space is a matter which the gardener has to take into account, at least in suburban districts, where land is necessarily more costly than in farming communities.

Plants should cover the entire ground, each having just enough room to allow full development and no more. To learn how much seed will be necessary we must consider the character and fertility of the soil, its preparation, and the peculiarities of the plants to be grown, whether large or small. If the land is kept clean and free from weeds less seed will be required. In the following pages the quantities of seed recommended are based on conservative methods of planting and will be found a safe average for use in the family garden.

**Change of Seed.**—With a few exceptions our cultivated plants originally were wild, and in a state of nature were much less valuable as articles of food for man and his domesticated animals. They have been brought to their present state of excellence by careful selection and cultivation. In all cultivated plants there is a tendency to revert to the aboriginal form, that is, there is a natural tendency to lose those characteristics for which we value them and to go back to the original condition of the wild plant. This tendency to degenerate can be prevented in some degree by high cultivation and care in the selection of seed. Indeed, selection is the basis, the foundation principle on which all improvements in vegetable forms rest.

Soil and climate exercise a determining influence on growth; notwithstanding the skill of man and his watchfulness in guarding against deterioration, common experience proves that under unfavorable conditions determined by soil and climate, plants gradually lose their best qualities and revert to inferior forms. It is obvious that such localities are not suitable ones in which to perpetuate the type.

To avoid the evils of sowing inferior or degenerated seeds we must use those produced in other localities where special soil and climatic conditions enable the professional seed grower to raise seeds in the highest degree of perfection and purity. For it is plain that where the plant thrives with the utmost vigor there is the locality suited to the perpetuation and improvement of the type.

Under many circumstances a change of seed is an agricultural necessity, and this necessity has made possible the enormous development of the seed-growing industry in all civilized lands.

In the home garden, where the object is to obtain a succession of the best vegetables, we doubt if it ever pays the gardener to attempt to save his own seed.

The saving of seed is the special business of the seed grower, and the professional seedsman knows the requirements of his patrons much better than they do themselves. It is a well known fact that in no one known locality will all vegetable forms thrive with equal vigor, and where seeds are grown each locality has a reputation for some special class. The seedsman finds these localities out, and places his contracts accordingly. The seeds the gardener receives from his seedsman are not even all from the same continent, but each kind comes from that part of the habitable globe which produces the best of whatever sort it may be.

**Soaking the Seed.**—Steeping the seed is condemned by many horticultural writers, but we know of little authentic evidence that the practice is injurious, and with some slowly germinating seeds like beet, carrot, mangel, salsify, and parsnip, the vegetative processes are undoubtedly hastened by steeping. Seeds have a wonderful power of resisting the injurious action of liquids that would almost instantaneously kill the parent plants. Darwin mentions the case of an asparagus plant with ripe berries, which floated in sea water for twenty-three days, and which when dried floated for eighty-five days in the same medium, after which the seed germinated. Out of 87 kinds of seed tested by him and immersed in sea water, 64 germinated after an immersion of twenty-eight days, and a few survived an immersion of 137 days. If good seed is sown at the right season and in a well prepared seed bed, the natural warmth and moisture of the soil will in due time bring forth the plant. Soaking seed in solutions of ammonium salts, lime-water, common salt, etc., will not, as some gardeners suppose, supply the place of manure. Solutions of corrosive sublimate, sulphate of iron, sulphate of copper, etc., are sometimes used for steeping seeds and tubers, to destroy the spores of certain bacterial diseases, but the use of these agents has no reference to germination.

**Depth of Covering.**—Deep planting is a frequent cause of failure in the seed to germinate, and it also retards growth when the seed does germinate, and the plant with difficulty makes its way upward to the light and air.

The seed should be covered to sufficient depth to secure the heat, moisture, and air needful for germination, but no deeper. The depth varies with the kind of seed, the nature of the soil, the climate, and the time of planting. Very small seeds require only a shallow covering, or simply rolling in. A clay soil is less easily penetrated by air and warmth, and the seed requires less covering than in a sandy one. The writer's experience is that deeper planting is required in late summer or early autumn than in spring. This is directly opposed to the teachings of some writers, but it is founded on experience.

Warmth and moisture are necessary to germination. In spring moisture is usually abundant, but the soil is cold and warmest near the surface. A thin covering of soil is at this time more favorable to germination. In late summer or early autumn the conditions are generally reversed. The earth is warm and moisture near the surface most deficient. A deeper covering is thus essential to secure the requisite moisture.

Some seeds germinate more quickly and surely if planted edgewise and with the germ end down. This is the case with all vines. Cucumber, melon, squash, and pumpkin seeds germinate with greater certainty when planted in an upright position with the germ down, and Lima beans should always be planted edgewise with the eye down.

## TIME OF PLANTING.

No precise rules can be laid down as to the time of planting; the gardener must be governed by the practice of the best gardeners in his locality and by the peculiar circumstances of his surroundings.

The season advances northward along the Atlantic coast at the average rate of about thirteen miles per day, or about 100 miles per week. In the great truck-growing regions of the east, which comprise a narrow strip of the light, sandy soils of the coastal lowlands of the Atlantic seaboard, the extreme difference between the time of planting at the northern and southernmost limits is about one hundred and sixteen days.

This region extends along the Atlantic coast for a distance of about 1500 miles, from Florida to Massachusetts.

Over a large part of the United States early cabbage, cauliflower, celery, egg plants, lettuce, cucumbers, peppers, and tomatoes are sown during the latter part of winter under glass; cabbage and cauliflower are transplanted to the garden about the time the apple trees are in blossom. The earliest bush beans, carrots, celery, lettuce, leeks and early potatoes are planted about the same time. Beets, onions, peas, parsnips, salsify, and early turnips can be planted a little earlier,—about the time the peach trees are in bloom,—or as soon as the ground is dry enough to work. In the case of egg plants, cucumbers, peppers and tomatoes, transplanting must be deferred until the weather is settled and the ground warm; bush and pole beans (except Limas), okra, early squashes, late lettuce and celery may be planted at the same time. Lima beans, sweet corn, cucumbers, melons, fall and winter squashes, must be deferred until all danger of frost is past.

The time of planting will necessarily vary with, first, the climate; second, the season; third, the character of the soil; and fourth, the kinds of plants to be grown.

## CLIMATE.

Diversities of climate depend on many causes, some of which are general and others local.

Among general causes the first in importance is latitude, or distance from the equator, where the sun at noon is directly overhead. The height above the horizon to which the sun rises at noon, other conditions being the same, will determine the kind of climate. A second cause is elevation above sea-level. Lines of equal temperature conform in a general way to the contours of altitude. The higher we ascend above the level of the sea, in any given region, the colder it becomes; changes in base level greatly modify temperature and humidity, and these, primarily, determine the distribution of plants and animals.

In ascending lofty mountains a succession of climatic belts may be traversed similar to those encountered in journeying from the tropics to distant polar regions; each belt will be found to support a distinctive flora and fauna, until upon the higher summits we find a region of perpetual snow, abandoned by animals and where all vegetation disappears.

We have an interesting illustration of this in the biological survey made by the division of Ornithology and Mammalogy of the United States Department of Agriculture in 1891, and popularly known as the Death Valley Expedition.

This region embraces the highest and lowest lands within the United States,—from Death Valley, nearly 500 feet below the level of the sea to the lofty, snow-capped peaks of the high Sierra, culminating in Mount Whitney, at an altitude of nearly 15,000 feet.

The region was selected because of the exceptional advantages it offered for studying the distribution of animals and plants in relation to the effect of temperature and humidity at different altitudes. The close proximity of desert valleys and lofty mountains brings near together species which in a more level country are characteristic of widely remote regions.

Thus, in one place on the east side of the Sierra all of the life zones of North America, from the table-land of Mexico to the Polar sea, may be crossed in a distance of ten miles.

A third cause for diversity of climate is distance from the sea. Nearness to the sea or to large bodies of water has a tendency to moderate the cold of winter and the heat of summer. A fourth cause, particularly affecting the ripening of fruits and the earliness of many vegetables, is the brightness of the sun from the clearness of the atmosphere. The heat of clear, uninterrupted sunshine ripens fruits more rapidly, and developes the juices much more effectually than the same amount of heat under a clouded or murky sky; and the same is true of many vegetables, bright sunlight favors their development and hastens their maturity.

Some local causes of diversities in climate are the condition of the surface of the country, whether well wooded or bare, situated in the mountains or on plains, at the bottom of valleys, if protected against prevailing cold or hot winds, or if exposed to their violence; the nature of the soil, its inclination and exposure to the north or to the south; and too much or too little sunshine.

In any given locality a dry, warm sandy soil, other conditions being the same, is ready for planting much earlier than a compact clay.

The earliness or lateness of the spring, makes a great difference in the time of planting, and a dry or wet season will decide not only the time of planting but will also affect the yield, quality and maturity of the crops produced.

The foregoing are some of the general and local causes that influence climate, and climate and soil determine what kinds of crops shall be grown.

## GEOGRAPHIC DISTRIBUTION OF PLANTS AND ANIMALS.

The territories of the United States are divided by naturalists into a definite number of belts or zones, each of which is characterized by the presence of certain native plants and animals, and which under cultivation is fitted for particular agricultural industries. The life areas of plants and animals conform to certain general principles of temperature control.

The fact has been long recognized that associated species, both plants and animals, are not universally distributed over the earth, but disappear along certain more or less definite lines which indicate a change in temperature uncongenial to the species, but exactly what temperatures exert the controlling influence and how they can be measured have only recently been discovered. Plants require a definite sum total of heat in order to successfully perform their several vital functions,—germination, leafing, flowering, and fruiting,—and unless a particular sum of heat is attained, which varies with the constitutional requirements of plants, they cannot mature seeds. And with animals, their dispersion over the continent is found to conform to certain lines of equal temperature during the season of reproduction.

"The reason," says, Dr. C. Hart Merriam, "certain animals and plants are restricted to particular belts where no visible barriers exist to prevent dispersion is that the sensitive organizations of such species have become adapted to the particular physical and climatic conditions there prevalent and are not sufficiently plastic to enable them to live under other conditions. What is true of animals and plants in a state of nature is true also of animals and plants as modified by man;

for every race or breed of sheep, cattle, or swine, and every variety of grain, vegetable or fruit thrives best under particular conditions of temperature, moisture and exposure."—(Rep. Sec'y. Agr. 1893.)

One of the most important achievements of the Federal Government, both from its high scientific interest and weighty practical utility to agriculture, is the recently completed biological survey, mapping out the boundaries of the several life zones of the United States. This great work, accomplished by the Division of Ornithology and Mammalogy of the Department of Agriculture, has made clear the important facts that the same laws govern the distribution of animals and plants, and that the resulting areas of distribution are essentially coincident.

It has been found that animals and plants coincide in distribution, so that a map showing the boundaries of an area inhabited by an association of species in one group serves equally well for the other groups.

In other words the territories of the United States, and in fact those of the entire continent of North America, are divided into a number of clearly defined life areas or life zones, in which certain wild and cultivated plants, and certain native and domesticated animals will thrive, and in which certain troublesome weeds and destructive species of insects are to be expected. Beyond the boundaries of one life zone or one life area, another association of native animals and plants is to be met, and another determinate class of agricultural productions will thrive, while different species of weeds and noxious insects are to be expected and combated.

In reviewing the relations which the geographic distribution of plants and animals bear to agricultural pursuits, Dr. C. Hart Merriam, in the Year Book, United States Department Agriculture, 1894, says:—

"When the boundaries of the life zones and areas are accurately mapped, the agriculturist need only ascertain the faunal area to which a particular crop or garden plant of limited range belongs, in order to know beforehand just where it may be introduced with every prospect of success, soil and other local modifying influences being suitable; and in the case of weeds and of injurious and beneficial mammals, birds, and insects, he would know what kind were to be looked for in his immediate vicinity, and could prepare in advance for noxious species that from time to time suddenly extend their range. Persons living within the area likely to be invaded could escape by planting crops not affected, while those living outside might largely increase their revenues by giving special attention to the cultivation of the crops that are affected in the adjacent life zone. In short, a knowledge of the natural life areas of the United States and of their distinctive species and crops would enable our farmers and fruit growers to select the products best adapted to their localities, would help them in their battle with harmful species, and would put an end to the present indiscriminate experimentation by which hundreds of thousands, if not millions of dollars are needlessly expended each year."

## THE SEVEN LIFE ZONES OF NORTH AMERICA.

Our native animals and plants are distributed from two directions,—one class come from the north and the other from the south. Those from the north are defined by naturalists as Boreal species and those from the south as Austral species. In their dispersion over the continent it is found that their life areas take the form of a definite number of transcontinental belts or zones which naturally arrange themselves in two principal regions—a northern or Boreal and southern or Austral region.

Through the courtesy of Hon. J. Sterling Morton, Secretary of Agriculture, we are enabled to present as a frontispiece to this work a map of the life zones of the United States, reproduced from the original engraving in the Year Book of the United States Department of Agriculture for 1894.

* The continent of North America has been divided into three primary life regions, (1) Boreal, (2) Austral, and (3) Tropical, each stretching across the continent from ocean to ocean, though with tortuous boundaries conforming to the distribution of temperature.

The Boreal region stretches from Nova Scotia and Newfoundland westward to the Pacific Ocean and from northern New England and the Great Lakes northward to the pole, and southward over the principal mountains of the United States and Mexico. It is subdivided into three principal belts or zones, Arctic, Hudsonian, and Canadian.

The Arctic or Arctic-Alpine belt comprises Arctic America above the limit of tree growth, including Greenland, and a narrow strip along the coast of Labrador and Newfoundland, and also the summits of the higher mountains above timber line throughout the United States and Mexico.

It is characterized by such plants as Arctic poppy, dwarf willow, and

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* Abstracted from the Year Book of the United States Department of Agriculture, 1894.

various saxifrages and gentians, and is a zone of no agricultural importance. The Hudsonian zone embraces the northern half of the great forest region stretching from Labrador to Alaska. It comprises the northern or higher parts of the great transcontinental forest of spruce and fir, but is of no agricultural importance.

The Canadian zone embraces the southern half of the great coniferous forest, stretching from New England and Nova Scotia to British Columbia. It comes into the United States from Canada, and covers the northern parts of Michigan, Vermont, New Hampshire, and Maine. Further south it is restricted to the summits of the higher Alleghanies. Counting from the north, this zone is the first of any agricultural consequence. Here white potatoes, turnips, the Oldberg apple, and the more hardy cereals may be cultivated with moderate success.

The Austral region is likewise subdivided into three transcontinental zones: (1) A Transition Zone; (2) an Upper Austral Zone; (3) a Lower Austral Zone; all stretching from the Atlantic to the Pacific and winding about sufficiently to cover areas of equal temperature from ocean to ocean. Each of the three Austral belts may be subdivided in an east and west direction into two or more areas, some of which are based on humidity instead of temperature.

The Transition Zone is the belt in which Boreal and Austral elements overlap. It covers the greater part of New England, New York, Pennsylvania, Wisconsin, and Southern Michigan, and pushes south along the Alleghanies to extreme Northern Georgia.

Here the oak, hickory, chestnut, and walnut of the south meet the maple, beech, birch, and hemlock of the north. The same overlapping is found among animals. In this zone we enter the true agricultural part of our country, where apples (Oldberg, Baldwin, Greening, Seek-no-further, and others), blue plums, cherries, white potatoes, barley and oats attain their highest perfection. The eastern ends of these three belts have been long recognized by zoölogists and are known as the Alleghanian, Carolinian and Austroriparian faunas.

*The Carolinian Zone* covers the larger part of the Middle States except the mountains; on the Atlantic coast it reaches from near the mouth of Chesapeake Bay to southern Connecticut, and pushes still further north in the valleys of the Hudson and Connecticut rivers. It is the region in which the sassafras, tulip tree, hackberry, sweet gum and persimmon first make their appearance. In this zone the Ben Davis and wine-sap apples, the peach, apricot, quince, sweet potato, tobacco, and the hardier grapes, such as the Concord, Catawba, and Isabella, thrive best.

*The Austroriparian Zone* covers the greater part of the South Atlantic and Gulf States, beginning at the mouth of Chesapeake Bay. The long-leafed pine, magnolia, and live oak are common on uplands, and the bald cypress and cane in swamps.

This is the zone of the cotton plant, sugar cane, rice, pecan and peanut ; of the oriental pears (Le Conte and Kieffer), the Scuppernong Grape and of the citrus fruits—the orange, lemon, lime, and shaddock. In its western continuation (the Lower Sonoran) the raisin grape, olive, and almond are among the most important agricultural products, and the fig ripens several crops each year.

*The Tropical Region* comprises Central America, the greater part of the coastal lowlands of Mexico, and the Antilles. Within the United States it is restricted to Southern Florida, extreme southeast Texas (along the Rio Grande and Gulf Coast), and the valley of the lower Colorado in Arizona and California. Among the tropical trees that grow in Southern Florida are the royal palm, Jamaica dogwood, manchineel, mahogany and mangrove. The banana, cocoanut, date palm, pine apple, mango and cherimoyer thrive in this belt.

In its broader aspect the study of the geographic distribution of life in North America is completed. The primary regions and their principal subdivisions have been defined and mapped, the problems involved in the control of distribution have been solved and the laws themselves have been formulated. The work remaining undone relates to details and may be classed under four heads : (1) Completion of the boundary surveys of the several zones ; (2) subdivision of the zones into minor faunas and floras ; (3) tabulation of the distinctive species of each zone and its subdivision ; (4) formulation of the subordinate laws governing the restriction of species to particular areas within the principal zones.

# PART II.

# WHAT TO GROW IN THE HOME GARDEN.

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## ARTICHOKE, FRENCH (*Cynara scolymus*).

*One Ounce of Seed to One Hundred Feet of Row.* A hardy perennial growing from three and one-half to four feet high, believed to have been derived by cultivation from the wild Cardoon.

CULTURE.—The artichoke attains its highest development in a deep, rich sandy loam, but will thrive in almost any soil made fine by deep culture, and enriched with heavy dressings of well-rotted manure. The plants are propagated from seed, by dividing the stools, or from suckers. Seed should be sown in the hotbed early in spring, in rows six inches apart and half an inch deep; the seedlings are transplanted into pots or boxes, where they should have plenty of room and sunlight. When all danger of frost is past transplant to the open ground. The rows should be from three to four feet apart, and the plants two feet distance from each other in the rows. Set plants firmly in the ground, water copiously, and keep free from weeds by the frequent use of the hoe. Thus raised, heads, which are the parts used for culinary purposes, are abundantly provided from September until frost.

ARTICHOKE.

Seed may also be sown in the open ground in April or May, but the seed-bed should be made in a sheltered situation, and the tender plants be given protection at night and on the frequently recurring cold days of spring. Raised in this manner the plants will not produce edible heads the first season north of Virginia.

Plantings may also be made by detaching below the surface the suckers or shoots produced around the stools that flowered the year before, and planting in the same manner as seedlings. The second year heads will commence to form in July. By cutting back the flowering stems close to the ground at this time, tender shoots will rapidly grow, which may be tied up and blanched like celery, and used like cardoons. Late in autumn cut off the tops and protect the crowns with a covering of leaves or litter, and in spring work into the soil a dressing of finely rotted manure and bone meal.

In a congenial soil and climate artichoke should be renewed every three or four years. For the family garden set out a few vigorous shoots or suckers each spring.

Varieties.—The Large Green Globe is the standard garden variety.

## ARTICHOKE, JERUSALEM (*Helianthus tuberosus*).

*Three Bushels of Tubers are Required to Plant an Acre.* A hardy perennial growing from six to eight feet high, believed to be indigenous to northeast North America. It bears no resemblance to the French Artichoke, but botanically is a species of Sunflower, producing underground shoots which, like the potato, swell into true tubers. These are used as human food in some parts of Europe; in America the tubers are used to a slight extent as a salad, but are grown chiefly for feeding to stock, especially swine.

It is propagated from the tubers, which should be planted in rows from four to five feet apart and one foot apart in the rows; plant at the same time and in the same manner as early potatoes.

Artichoke roots are carried in stock by few seedsmen, but may be obtained from large produce dealers.

## ASPARAGUS (*Asparagus officinalis*).

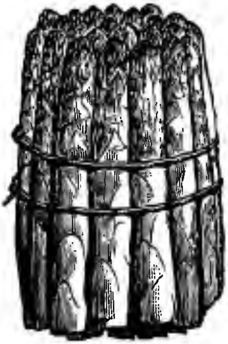
*Two and a Half Ounces of Seed to One Hundred Feet of Row.* A perennial of ancient cultivation, native to the maritime provinces of Europe and probably of Western Asia.

Culture.—Asparagus succeeds best on sandy, saline soils near the sea, but may be grown with success in any family garden, provided the ground is made friable by deep cultivation and by the use of an abundant supply of well-rotted manure. If the land is of a stiff, tenacious character a few cart-loads of sharp sand from some near-by stream spread over the bed after it has been plowed or spaded up, will permanently improve the texture of the soil, and more than repay, in the yield and quality of the asparagus, for the labor thus expended.

*From Roots.*—For the home garden we advise that well grown one or two-year-old roots be planted. Make rows five feet apart and about six inches deep; set the roots in the bottom of the rows two feet apart, cover with about two inches of rich soil, and as the plants grow give thorough cultivation, and fill in the trench at each hoeing until level with the surface of the bed.

When stalks turn yellow in the fall, cut off close to ground, rake into heaps and burn. The bed should be well mulched with manure after it has been cleaned off, and in field culture the manure should be applied along the rows. In early spring rake off the coarser portion of the manure and dig in the remainder, being careful not to disturb the crowns or roots. The small bed is best maintained by applying a heavy dressing of a good commercial fertilizer after the season is past for cutting the shoots. Cease cutting as soon as early varieties of culinary peas are ready for the table.

*From Seed.*—Seed should be sown in early spring, just as soon as the land can be easily worked. Plow or spade deeply, and give the ground a heavy dressing of rotted manure. Pour hot water on the seed and let it soak in a warm place for twenty-four hours before planting. Sow thinly in drills ten to twelve inches apart, and two inches deep; when the plants are up, thin out to not less than two inches apart. If the land is rich and has been kept loose and well cultivated the plants may be set out in the permanent bed the next spring.


Barr's Mammoth Asparagus.

The Asparagus Beetle is pretty sure to put in an appearance just about the time bunching begins for the early market. In the family garden the eggs may be rubbed off before hatching, or if domestic poultry are allowed to have the run of the asparagus bed the beetles will be greedily devoured. One of the best remedies is fresh, air-slaked lime dusted on the plants in the early morning while the dew is on. It quickly destroys all the grubs with which it comes in contact.

Varieties.—Conover's Colossal is an old standard variety. Palmetto is the variety which is planted mostly by southern growers. Barr's Mammoth is very tender and succulent, and is decidedly our choice for the family garden. The Columbia Mammoth White will be preferred by those who desire a white asparagus; the thick white stalks are produced above the surface.

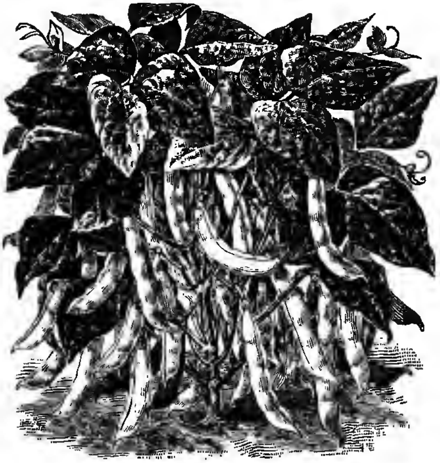
## BEANS (*Phaseolus*).

Annuals quickly coming to maturity, except the Limas, which in their native habitat are of perennial growth. The more common Dwarf or Bush Beans have their parentage in a species believed to be native to the East Indies.

The Pole or Running Beans are from tropical South America; they were carried to Europe about the middle of the seventeenth century. All modern varieties under cultivation are derived from species native to the warmer regions of the earth, notably India and America.

### Beans—Bush, Dwarf, Snap or String (*Phaseolus vulgaris*).

*One Quart of Seed to One Hundred Feet of Drill.*



BURPEE'S PERFECTION WAX BEAN.

CULTURE.—Bush Beans come into bearing most quickly in rich, sandy soil, but the quality of the product is not so good, nor is the yield so prolific as in moderately strong loam. Whatever the character of the soil of the home garden, it should be worked deeply and made fine before planting. Seed must not be sown until the ground is quite warm and dry; sow in drills eighteen inches apart, and from one to two inches deep; the plants when well up should be thinned out to from three to four inches apart in the drills. Give frequent shallow hoeings, so as not to disturb the roots near the surface.

On a southern slope or in other locations affording protection from exposure, the earliest varieties may be planted a week earlier than in less favorable situations, and will be ready for use in from forty to forty-four days from planting. The later varieties will continue longer in bearing, and for this reason are more desirable for the family garden.

Plant a succession from early in May until August, or later in the South.

VARIETIES.—First in point of earliness, tenderness, and excellence of quality we place *Burpee's Stringless Green Pod Bean*, which is now closely followed by the white-seeded selection, *Fordhook Favorite*. They are earlier than the Early Yellow Six Weeks, while the crisp, fleshy pods are longer and straighter than the Red Valentine, and therefore superior to either of these varieties, both in appearance and quality.

Among other productive Green-Podded Bush Beans are Early Yellow Six Weeks, Round Yellow Six Weeks, Refugee or 1000 to One, Full Measure, and the Extra Early Red Valentine.

Among Wax-Podded varieties we suggest Rust-Proof Golden Wax, Burpee's Saddleback Wax, Burpee's Brittle Wax, Burpee's New Kidney Wax, Pencil-Pod Black Wax, and Burpee's White Wax.

## Bush Lima Beans.

There are three distinct types of Dwarf or Bush Limas, all of which are used exclusively as shell beans.

The earliest are Henderson's and its improved type, Wood's Prolific. *Burpee's* and *The Burpee Improved* are the bush types of the large white Lima; these are grown exclusively where the flat Lima is desired. The Kumerle, Thorburn's, or Dreer's Bush Lima is a dwarf-growing strain of the well-known Challenger or Potato Lima, but this variety has been practically displaced by the *Fordhook Bush Lima*, which has the upright growth and large foliage of the original *Burpee Bush Lima*, and produces "potato" Lima beans of the finest quality.

CULTURE.—The Bush Limas may be planted in hills three feet apart each way, or in drills three feet by 20 inches apart in the drills. Plant edgewise with the eyes down and two inches deep.

BURPEE'S FORDHOOK BUSH LIMA BEAN.

Other shell varieties of Bush Beans, both for summer and winter use, which should find a place in the home garden, are the *Dwarf Horticultural, Goddard* or *Boston Favorite,* and *White Marrowfat.*

## Beans—Pole or Running Varieties.

*One Pint of Seed to One Hundred Hills.* Pole Beans are more tender than the Dwarf varieties and should not be planted until the weather is warm and settled and the ground dry. They succeed best in warm, sandy loam. Well rotted stable or poultry manure may be used to enrich the ground, but beans of all kinds do best on land made fertile by manure applied in a previous season. Before planting the seed set the poles, from six to eight feet long, in rows running north and south, four feet apart each way in the rows. Around each pole plant from six to eight beans, two inches deep; when well started thin out to four plants to a hill.

At FORDHOOK we reserve the same location year after year for our trials of pole snap beans and pole limas, as we have found they do better, the vines being stronger and more productive, and this we feel sure is owing to the nitrogen-gathering characteristic of the bean roots.

The Pole Limas are more tender than other running beans and should not, on this account, be planted until a week or fortnight later. As with the Dwarf Limas, the pole varieties should be planted edgewise with the eye down. To keep the vines in continuous bearing until killed by frost pull all pods before they have ripened seed. The ripened beans are excellent for winter use.

If poles cannot be obtained, set stout stakes at each end of the row where the beans are to be planted, and stretch a heavy wire at bottom and top, allowing from six to seven feet between, and to these wires attach strings, spacing them about two feet along the row, allowing only one plant to a string.

Among Pole or Running Beans described in "Burpee's Annual" and suited to the family garden are the following:

Burpee's Sunshine Wax, Golden Cluster, Burger's Green-Pod Stringless, White Creaseback, or Best of All, Lazy Wife's, Horticultural, Cranberry or Wren's Egg (Kentucky Wonder), Old Homestead, and Dutch Caseknife.

Among Pole Limas we recommend the Small Lima, Carolina Sieva or Sewee, Early Leviathan, Challenger or Potato Lima, Burpee's Giant-Podded, Ideal Large White Lima and King of the Garden Lima.

### TABLE I.—BEANS.

*Average Number of Days from Planting to First Fair Picking.*

| DWARF VARIETIES:— | *Days.* | DWARF VARIETIES:— | *Days.* |
|---|---|---|---|
| Pencil-Pod Black Wax, . . | 48 | Golden Wax, Improved, | 49 |
| Burpee's Stringless Green Pod, . . . . . . . . | 48 | Burpee's New Kidney Wax | 50 |
| Early Yellow Six Weeks, . | 49 | Refugee, Extra Early, . | 50 |
| Extra Early Red Valentine Improved Round Pod, . | 49 | Refugee, Wax, . . . | 59 |
| Perfection Wax, . . . | 49 | Round Yellow Six Weeks, | 49 |
| Goddard or Boston Favorite, . . . . . . . . | 60 | Saddleback Wax, Burpee's, | 47 |
| | | Burpee's White Wax, . . | 60 |
| | | Burpee's Bush Lima, . . | 78–85 |

Like all other vegetables, as a green table vegetable beans are best when cooked immediately after picking. A continual supply of the bush snap beans may be had by selecting a variety adapted to soil and climate and making small plantings every two weeks up to the middle of August.

## BEET (*Beta vulgaris*).

*One Ounce of Seed to Fifty Feet of Drill.* A biennial of very ancient cultivation, probably a native of the Mediterranean regions of Europe, North Africa and Western Asia.

BURPEE'S EXTRA EARLY TURNIP BEET.

CULTURE.—A moderately dry and rich, sandy loam produces the finest beets. Fresh manure should never be used. If the land has not been heavily manured for a previous crop, dress with finely rotted stable manure, which should be well worked in and the soil made fine.

Sow the seed thinly in drills

fifteen to twenty inches apart and one-half to one inch deep, pressing the covering of fine soil firmly around the seed. When the first pair of leaves appear thin out to four inches apart in the drills. From the sowing of the seed, turnip varieties are ready for the table in from fifty to sixty days. Work the soil deeply as the roots increase in size to encourage strong growth and the forming of smooth, regular roots. For general crop sow as soon as the weather is settled. The supply for winter use may be planted in June and July or later in the South.

Varieties.—Among the best varieties for the home garden we mention the true Dark Stinson, which is particularly valuable for forcing. Fine table beets of two and one-half inches in diameter will have foliage scarcely five inches high, the leaves proper being only three inches long, of a deep, rich red color. They can be grown close together, four inches apart in the row being sufficient. The roots are smooth and regular in form; the skin is dark blood-red. The flesh is fine-grained and free from woodiness, even when fully matured. Of rich color, the beets cook dark blood-red, and remain in fine condition a long time.

Columbia is a blood-red turnip variety, very early, with neat, smooth skin, and of the finest quality. Burpee's Extra Early Turnip is of fine globular shape, the flesh being of alternate rings of light and dark pink, very tender, and sweet. It is fit for use in from seven to eight weeks from sowing, and very productive.

Among other reliable varieties are Detroit Dark Red, Early Model, Eclipse, Edmand's, Burpee's Improved Blood Turnip, Bastian's Half Long Blood Red, and Long Smooth Blood-Red.

Early Yellow Turnip Beet is similar to the Red Turnip, except in color, which is a bright yellow. It has a fine flavor, and is deserving of more general cultivation.

The Swiss Chard or Silver Beet, also known as the Large-Ribbed White Silver Beet, is a distinct variety of *B. vulgàris,* the edible parts of which are the leaves. Sown early in the spring it makes a quick growth, and is ready to be used for greens sooner than any of the root-developing varieties.

## SUGAR BEET AND MANGEL WURZEL

(*Beta vulgaris macrorhiza*).

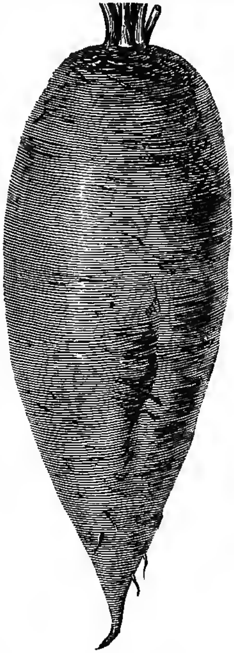
*One Ounce of Seed to One Hundred Feet of Drill.*

Culture.—The land must be rich to produce a profitable crop. In locations where these roots are extensively grown for stock-feeding, complete fertilizers are used frequently, as much as from 1000 to 2000 pounds to the acre. For the garden, bone-meal and wood-ashes may be used alone or in conjunction with short, thoroughly rotted manure. Under generous fertilization the yield is enormous.

As an addition to the bill-of-fare of the family cow the value of sugar beets or mangels will soon be shown in the improved condition of the animal and in increased flow of milk.

Plant from two feet to 30 inches apart in drills, one to two inches deep, in deep soil made fine by thorough preparation, and thin out the plants to eight inches apart in the rows. Plant during May, June, or July.

The Danish Improved, Lane's Imperial and Giant Half-Sugar are excellent, and in good soils are very productive. The Golden Tankard, Golden Giant and Mammoth Prize Long Red Mangels are all first-class and yield enormous crops.



LONG BEET.

## BORECOLE or KALE

(*Brassica oleracea sabellica*).

*One-third of an Ounce of Seed will Sow One Hundred Feet of Drill, or one Ounce of Seed will give about Five Thousand Plants.* Borecole or Kale is a term generally applied to loose, curly or plain-leaved types of the cabbage family which do not form heads, and are noted for their hardiness.

There are many sub-varieties, variously known as German Greens, Scotch Kale, Sprouts, Siberian Kale, etc., all of which are derived from species native to the coasts of Great Britain and Northwestern Europe. Many varieties now under domestication are of very delicate flavor, tender and sweet after exposure to frost, and should be much more generally grown as winter vegetables.

CULTURE.—North of Philadelphia, kale may be sown from the middle of April until early in May. Sow the seed in beds of finely prepared rich soil, and cover evenly but lightly. Transplant in June, giving the same general cultivation as cabbage. In this latitude and to the South, seed may be sown in September in drills two and a half feet apart; thin out to from four to twelve inches apart, according to the variety planted, and cover with litter during the winter.

In the family garden the rows may be one foot apart, and the plants should have the same culture as spinach. If taken up before severe frosts, kale may be trenched in up to the lower leaves and then covered with straw; in this condition it will keep fresh and crisp during winter. In the Southern States, where kale is now grown in large quantities for Northern Markets, the more hardy varieties remain sweet and tender the entire winter. Ready for the table in from one hundred to one hundred and thirty days.

DWARF GERMAN CURLED KALE.

VARIETIES.—Dwarf German, Tall Green Curled Scotch, and Dwarf Siberian are fully described in "Burpee's Annual."

### **BROCCOLI** (*Brassica oleracea; Var. Botrytis cauliflora*).

*One Third of an Ounce of Seed to One Hundred Feet of Drill, or One Ounce of Seed Will Produce about Three Thousand Plants.* Broccoli is a cultivated variety of the wild cabbage closely related to cauliflower, which it probably antedated in cultivation. The improved varieties of more modern introduction are scarcely distinguishable from the cauliflower, but the plants are generally of taller growth with stiffer and more numerous leaves, while the heads are smaller and more divided than the cauliflower.

CULTURE.—Like cabbage and cauliflower, broccoli thrives best in deep, rich, moist soil and in cool weather. The seeds should be sown at the same time and the plants receive the same general culture, as cabbage. Completes its growth from seed in from one hundred and twenty to one hundred and forty-five days.

## BRUSSELS SPROUTS (*Brassica oleracea bullata*).

*One-third of an Ounce of Seed to One Hundred Feet of Row. One Ounce of Seed will Produce about Forty-five Hundred Plants.* A member of the Cabbage family deserving of more general cultivation as a winter vegetable. It is an annual, indigenous to Europe, and in its native habitat is widely distributed, especially near the sea.

BRUSSELS SPROUTS.

CULTURE.—Sow the seed in May or June in the same manner as for late Cauliflower, in fine but not over-rich soil. Transplant in July or early August into rich, strong soil; the rows should be one and a half feet apart and the plants one foot from each other in the rows. Keep free from weeds; the surface soil should be kept well cultivated to prevent evaporation. Matures in 140 to 150 days from seed.

VARIETIES.—Perfection and Paris Market are desirable varieties. Long Island Improved is now one of the popular varieties, while Burpee's Danish Prize, a recent introduction, has a long stalk thickly set with handsome large sprouts.

## CABBAGE (*Brassica oleracea*).

*One-third of an Ounce of Seed will Plant One Hundred Feet of Drill, and Produce about Fifteen Hundred Plants.* The genus Brassica is believed to be of European and Siberian origin. From the aboriginal species are derived all our modern varieties of cabbage, cauliflower, rape, colza, and turnips, including the sub-varieties of Swedes or ruta bagas, kohlrabi, etc. The parent species abounds on the Siberian coast, along the shores of the Scandinavian peninsula, British Isles, and Western Europe. Our cultivated varieties of Cabbage, Borecole, Broccoli and Brussels Sprouts have a common origin in the wild cabbage, a perennial plant still found growing in rocky places by the seashore in Great Britain, Ireland, the Channel Islands on the Danish coast, and in several places on the northern shores of the Mediterranean. Unquestionably, the date of cultivation was very ancient, and the wild plant was probably gathered as food by man long before its domestication.

CULTURE.—Cabbage succeeds best in cool, moist climates, and in rather heavy, friable loams with gravelly subsoil. Good crops can, however, be grown on light, sandy soils, or even on heavy clays, provided the latter is under-drained and made fine and loose by thorough cultivation. Whatever the character of the land large quantities of rotted stable manure alone, or in connection with fine bone meal and wood ashes, should be used. The cabbage is a gross feeder and lime-consuming plant. The presence of an abundance of lime, as is supplied in bone-meal and wood-ashes, in well-worked, porous soil plentifully stocked with organic matter, furnishes ideal conditions for the growth of the crop. There need be no fear of making the land too rich. The quantity of fertilizing material used by some of our best market gardeners may seem astonishing, but it is not infrequently the case that $100 in manures is spread over an acre of ground before the plants are set. Whether for an early or late crop, continuous cultivation, from the sowing of the seed until the heads are well on toward maturity, is essential to success.

BURPEE'S ALL HEAD EARLY CABBAGE.

*Plant the Best Seed.*—The cost of seed is a mere trifle and can hardly be said to enter into the cost of producing a crop; yet the quality of the seed is a deciding factor between profit and loss. For this reason plant only the best strains of seed, regardless of the cost.

*Early Cabbage.*—About the middle of February sow seed in the greenhouse or hotbed for early summer cabbage. Sow in rows 10 to 12 inches apart and cover with half an inch of soil, which firm well down on the seed. When the plants appear keep dusted with tobacco dust, to prevent injury by the flea-beetle. As growth proceeds the plants should be gradually hardened by taking off the sash and exposing them to the outside air. Transplant to the open ground in March or April. Set the plants in rows three feet apart and from 20 to 24 inches apart in the rows. Early cabbage is ready for the table in about one hundred to one hundred and five days from the time of seed sowing.

*Late Cabbage.*—Late autumn and winter varieties may be sown from June to the beginning of July, and transplanted when about six inches high. A plot on which early potatoes or Peas have been grown may be cleared off in time to set the late plants. The best time for transplanting is on a cloudy but not very hot day. Mr. Lupton, in his little book, "Cabbage and Cauliflower for Profit," gives excellent advice for transplanting the late plants. He says, "One of the best rules is, never to wait for rain. The labor of setting the plants with water means extra expense, but it proves a valuable investment."

FOTTLER'S EARLY BRUNSWICK CABBAGE.

In setting plants at any time, except immediately after a rain, loosen them in the seed-bed with a pitchfork before pulling them, and when pulled, dip the roots in water, and keep quite moist until set. Use a stick four or five feet long and two and a half inches in diameter to make the hole at each planting place. Into each hole pour about a half pint of water, and firmly puddle in the plant. Over the wet earth sprinkle a handful or two of dry soil, to prevent evaporation. South of Philadelphia (latitude 40) sow from the middle of September, or later, according to latitude, and transplant into cold frames where the plants will not withstand the winter in the open ground. Set out in the open ground early in the spring.

INSECTS.—The Wavy-striped Flea-beetle, Cabbage Aphis, Cabbage Maggot, Cabbage Borer, Red Spider, Zebra Caterpillar, Harlequin Cabbage-Bug, Cabbage Mamestra, Imported and Native Cabbage Worms, are the chief insect enemies of the Cabbage. For the flea-beetle begin to use tobacco dust as soon as the plants appear above the ground. For the Aphis use kerosene emulsion, one part to 20 of water. The maggots in the ground are readily killed by injecting into the soil a little bisulphide of carbon, while a piece of tarred paper placed around the stem of the young plant is fairly effective in preventing the maggots from reaching the roots. For the various worms which infest the leaves, pyrethrum powder and kerosene emulsion are the safest remedies. Our little book, "Injurious Insects and the Use of Insecticides," gives complete directions for destroying these pests.

To preserve cabbage during winter pull them in dry weather and store in a cool cellar or bury them in the open ground with the head downward. Late cabbage matures in from one hundred and forty to one hundred and sixty days from planting the seed.

BURPEE'S SUREHEAD CABBAGE.

VARIETIES.—Among standard varieties described in "Burpee's Seed Annual" we especially recommend Early Jersey Wakefield, Fottler's Early Drumhead, or Short Stem Brunswick, Early Winnigstadt, Copenhagen Market and Burpee's All Head Early. Among late cabbages are Burpee's Surehead, Short Stem Drumhead, Danish Ball Head, Danish Round Head and Autumn King. Among Drumhead Savoys we recommend Perfection Drumhead, and among red cabbages Mammoth Rock Red and Large Red Drumhead.

## CARROT (*Daucus carota.*)

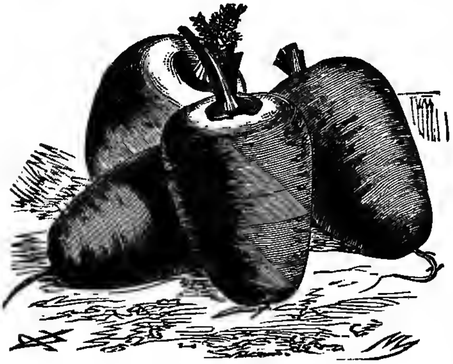
*One Ounce of Seed will Sow One Hundred Feet of Drill.* A biennial, indigenous to Europe, believed by some botanists to have been derived from the common wild carrot, and by others thought to have its parentage in a distinct aboriginal species.

Short Horn, or Early Scarlet Horn Carrot.

Culture. — Carrots thrive best in a warm, sandy soil which has been heavily manured for a previous crop. For an early supply sow the seed in drills fifteen to eighteen inches apart and half an inch deep. Sow as soon as the ground can be worked and firm the soil well upon the seed ; thin out the young plants to from four to six inches apart.

The seed germinates slowly and for this reason was formerly mixed with damp sand or loam several days before planting. For late crops sowings may be made from May until the latter part of July. With late plantings the seed should be covered with one inch of soil.

For field culture sow in drills from two to three feet apart and at the rate of from two to three pounds to the acre. As soon as the plants are fairly up, thin out and keep well cultivated. Forcing varieties are ready for the table in ninety-five to one hundred days ; later sorts in one hundred and ten to one hundred and twenty days.

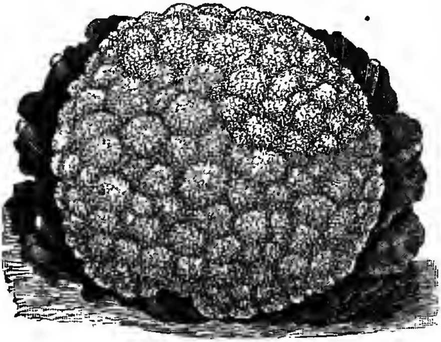


Ox-heart Carrot.

Varieties.—The Short Horn or Early Scarlet Horn is one of the most popular of early carrots, but the Early Very Short Scarlet, or Golden Ball is perhaps the earliest in cultivation. The Ox-heart or Guerande, Danvers Half Long, Burpee's Improved Long Orange, Saint Valery or New Intermediate, and Chantenay or "Model" are good garden varieties.

## CAULIFLOWER (*Brassica oleracea botrytis.*)

*One-third of an Ounce of Seed will Sow One Hundred Feet of Drill and Produce from One Thousand to Fifteen Hundred Plants.* As is the case with most of our garden vegetables the history of the cauliflower is unknown, but it is believed to have originated in Italy, and to have been very greatly improved by the Dutch, Danish and English gardeners. In the cauliflower the flower stems have been so modified by selection as to become transformed into a thick fleshy mass, the growth of which is produced at the expense of the flowers, which are absorbed and rendered abortive. Unlike other species of the genus, the cauliflower is of annual duration.



Best Early Cauliflower.

Culture.—For early summer use sowings may be made at the same time and in precisely the same manner as for early cabbage. It is not advisable to attempt to grow a mid-summer crop, as heads will not develop in hot, dry weather. The late crop should be sown at the same time as for the corresponding crop of cabbage, and have exactly the same treatment. Keep the young plants free from insects by the use of pyrethrum powder or tobacco dust. Cauliflower is ready for the table in from one hundred and five to one hundred and fifteen days from the sowing of the seed.

Cauliflower requires even a richer soil than cabbage, and a plentiful supply of water; or, what is better for the few plants required for the home garden, a rich manure liquor, made by soaking about a bushel of rotted manure, confined in an old gunny bag, in a barrel of water.

The manure may be renewed from time to time as its soluble components are exhausted. Thus treated, the soil is kept damp and well stocked with soluble food, which will insure a generous supply of large, half-globular shaped heads of the most delicious flavor. When these have attained a diameter of four or five inches, draw the leaves over the heads, and pin or tie them together in order to protect the white, fleshy heads from sun, wind, and rain.

Should some of the plants fail to head before the ground freezes, take them up with a large ball of earth attached to the roots and put them into a cold frame or cellar, where small, tender heads will form during winter.

VARIETIES.—We recommend for home planting Burpee's Best Early Cauliflower. It is remarkable both for extra earliness and certainty to head. The growth is dwarf compact, with upright growing leaves and with large snow-white, almost globular-shaped heads. The Early Snowball is also extensively planted. It is of dwarf habit and under favorable conditions nearly every plant will make a fine solid head of good size. The Extra Early Dwarf Erfurt of an extra selected strain is very dwarf in habit of growth, with pure white heads of superior quality. Planted the first of March, heads, nine to twelve inches in diameter, will be ready early in June.

EARLIEST DWARF ERFURT CAULIFLOWER.

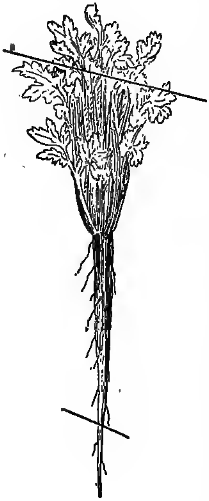
## CELERY (*Apium graveolens*).

*One-third of an Ounce of Seed will Sow One Hundred Feet of Drill. From Two Hundred and Fifty to Five Hundred Plants are ample for the Family Garden.* A fibrous, fleshy-rooted biennial which must have been under domestication from very early times, since its use as an article of diet is mentioned in the Homeric poems.

The wild species ranges from Sweden to Algeria, Egypt, Abyssinia and in Asia from the Caucasus to the mountains of British India. The wild plant abounds in marshes and on wet lands near the sea in the British Isles and Southern Europe.

Our modern garden varieties have their parentage in two wild species, one with red and the other with white stalks.

CULTURE.—Mr. Greiner's method of culture for the family garden, as given in his recent book, "Celery For Profit," is briefly as follows:



"In the latter part of February fill a flat box or large flower pot with nice, clean, mellow loam well pressed down and firmed. Apply water enough to make the soil quite moist; then sow the seed either broadcast or in narrow rows, rather thickly, and sift just a little sand or fine soil over it, firming well afterward. Cover the box or pot with a single thickness of light paper or cloth to keep the soil dark and moist, and set it in the kitchen or sitting room window, or in any place having a comfortable but moderate temperature. A hothouse with bottom heat would be a still better place for it. About ten days after sowing the seed will begin to sprout. Remove the paper or cloth cover and gradually get the plants accustomed to the light and air. Always water promptly, never letting the soil become thoroughly dry, yet at the same time carefully avoiding the opposite extreme. Next transplant the young seedlings into other boxes or flats * * * make the rows three inches apart and set the plants one-half to three-fourths of an inch apart in the rows. * * *

"A furrow or two may be opened on a vacant strip or between crops of quick growth that we know will be off by July, such as early peas, radishes, early lettuce, bunching onions, etc. Fill these furrows with fine, rich old compost (if containing a portion of poultry manure all the better), and then mix this compost and the soil well together. * * * Firm the soil well and smooth the surface with hoe and rake. * * * Cut off the ends of both roots and tops as illustrated in the Figure. Set the plants about five inches apart in a straight line, pressing the soil firmly about the roots of each plant." The rows should be from three to four feet apart.

The seed may also be sown in the open ground, as soon as the soil can be conveniently worked. Select moderately rich, finely prepared soil and before sowing firm the soil down with a spade or garden roller. Sow thinly in drills, one foot apart and from one-quarter to one-half an inch deep. Firm the soil well over the seed. The plants to make deep root growth should be started from one-half to three-fourths of an inch apart, and the tops be trimmed once or twice to induce a sturdy, stocky growth. In June or July transplant in rows three feet apart for dwarf, and four feet apart for the larger varieties. Set the plants six inches apart in rows or trenches six inches deep and one foot wide, filled in with rich compost. Trim off the leaves and roots before setting out and tread the soil firmly about the roots. The plants should begin vigorous growth at once, and in about six weeks, or when nearly full grown, should be "earthed up." The earthing up process must be carefully done. Begin by gathering the leaves in one hand and with the other draw the soil around the stalks, so that it cannot reach the heart of the plant. In a few days draw up

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"WINTER QUEEN" CELERY.

more earth; this should be repeated from time to time until only the top leaves are left uncovered.

The self-blanching sorts require the same treatment, not to blanch them, but to remove the strong, unpleasant taste, and to make them tender.

Celery requires from one hundred and sixty to one hundred and seventy-five days from seed to table.

VARIETIES.—Among the best for the family garden are the Golden Self-Blanching, White Plume, Giant White Solid, Giant Pascal, Winter Queen, and Dwarf Large-Ribbed or "Kalamazoo."

The Golden Self-Blanching is one of the best celeries in cultivation. It was first introduced by us from France in 1884 and has been growing in popular favor ever since. It is of close, compact habit of growth, with straight, vigorous stalks, which are perfectly solid, crisp, brittle and of delicious flavor. Without banking up or any covering whatever they become of a rich golden yellow color. The White Plume is one of the earliest celeries, but it does not keep longer than Christmas. Like the Golden Self-Blanching, the stalks and portions of the inner leaves and heart are white. The Giant Pascal is the best winter celery in cultivation. It partakes of the rich, nutty flavor peculiar to the Golden Self-Blanching, and is absolutely free from bitter taste.

## Celeriac, or Turnip-Rooted Celery.

*One Ounce of Seed will Sow One Hundred Feet of Drill.* Celeriac is little grown in America, but in Germany it is a favorite vegetable. The root is the edible part, which is cooked like turnips, and then sliced and soaked in vinegar.

CULTURE.—Sow in drills from one to two feet apart, and thin out to six inches asunder in the rows. Sowings should be made at the same time, and the plants given the same general cultivation as common celery. The bulbs may be earthed up four inches high when two or more inches in diameter. To keep through the winter cover with earth and straw, like beets, or store in the cellar in damp sand.

## CHICORY (*Cichorium intybus*).

*One Ounce of Seed will Sow One Hundred Feet of Drill.* Wild Chicory is a perennial, native to Europe and Asia, and naturalized in this country, where it is a common wayside weed. The roots are fleshy, somewhat resembling those of the Dandelion, to which family Chicory belongs.

Culture.—Early in spring sow the seed in rather light, rich soil, in drills 12 to 15 inches apart, and cover to a depth of one-half an inch. Thin out the young plants to six inches apart. Give the same general culture as the carrot. The roots are dried and ground, and used as a substitute for coffee. The Large-rooted or Coffee is the variety most grown in the United States.

Witloof or Large Brussels Chicory is grown solely for its blanched leaves, which are formed in a head like cos lettuce. Sow seed as directed for the ordinary Chicory, allowing the plants to grow on until frost, when the roots should be taken up, trimmed, placed in a trench or box sixteen to eighteen inches deep, and covered with soil, burying the roots about eight inches deep. If quicker growth is desired, cover surface of soil with manure to a depth of sixteen inches to three feet, and in a month's time remove this covering, when the blanched heads will be found ready for use.

## COLLARDS (*Brassica oleracea, var.*).

*One-third of an Ounce of Seed will Sow One Hundred Feet of Drill; one Ounce of Seed will Produce about Five Thousand Plants.* A variety of cabbage known as "Greens," "Colewort," and "Cole," which, under the climatic conditions of the South, has assumed a type quite distinct from that grown in the cool, moist climates of northern latitudes.

Culture.—In the North, sow from June until the middle of August; in the South from January to May, and from August to October. Culture is precisely the same as for cabbage. Ready for the table in from eighty to ninety-five days from sowing the seed. The variety most grown in the Southern States is the Georgia Collard. It forms a mass of leaves on a tall stem, and in the South continues to grow all winter.

## CHIVES (*Allium schœnoprasum*).

*One or Two Bunches are Sufficient for a Family Garden.* A hardy perennial, native to temperate Europe and Siberia. It is a member of the onion tribe, and is grown for the tops, which appear very early in the spring, and are used generally in the raw state for seasoning.

Culture.—Chives grow in thick tufts, and are always propagated by division, which may be effected either in autumn or spring. The usual practice is to set out a bed in March or April. The divided roots should be placed from eight to twelve inches apart. Make a new planting every three years. The tops appear very early in the spring, and may be shorn throughout the season as needed.

## CORN SALAD or VETTICOST (*Valerianella olitoria*).

*Three Ounces of Seed will Plant One Hundred Feet of Drill.* An annual of the valerian family, used as a salad during winter and early spring. It is found growing wild throughout Europe to 60° north latitude, also in North Africa and Asia Minor.

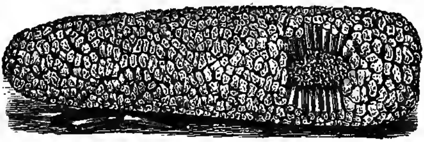
CULTURE.—Sow the seed during August or September in rich soil, in shallow drills not over one-fourth of an inch deep and about one foot apart; tread in the seed, and after the plants appear keep clear of weeds. On the approach of winter give a light protection of straw or leaves. Seed may be sown in the same manner early in the spring. In warm weather it is ready for use in from four to six weeks from planting the seed. Corn Salad is also known as Lamb's Lettuce. Matures in from sixty to sixty-five days. The Large Round-leaved, large-seeded variety is the best suited to garden culture.

LARGE ROUND-LEAVED CORN SALAD.

## SWEET CORN (*Zea saccharatum*).

*From One-fourth to One-half Pint of Seed will Plant One Hundred Hills.* Indian corn is a native of South America and was probably first cultivated by a semi-civilized agricultural people occupying the high table lands of New Granada.

De Candolle expresses the opinion that the unknown primitive form of maize had its habitation in the high regions of Chili and Mexico, and was diffused during the migrations of the aboriginal tribes, preceding the ancient Peruvians on the Western slopes of the Cordilleras in South America, and by the predecessors of the Toltecs and Aztecs in Mexico. There is an old Indian tradition that Nahuatl, Chief of the Nahuas, who occupied Mexico before the rise of the Aztec power, taught to his people the cultivation of maize.



IMPROVED NE PLUS ULTRA OR COUNTRY GENTLEMAN.

The origin of sweet corn is unknown, but it is said to have been found by officers of the expedition, commanded by General Sullivan, sent against the Indians of Western New York, in 1779.

Culture.—A warm, alluvial, but not heavy loam produces the finest Sweet Corn. The ground should be enriched with well rotted manure and deeply worked before planting.

For the short varieties plant in hills three feet apart, and for the tall sorts four feet apart each way. Plant a half dozen kernels to the hill; cover early varieties with one inch, and late ones with one and a half inches of soil. Tread upon the hill to compact the earth firmly on the seed; thin out to three plants to a hill.

Plantings may also be made in rows four and a half feet apart and the kernels dropped from eight to twelve inches apart.

Give frequent but shallow cultivation until in tassel.

In the vicinity of Philadelphia plantings are made from the first to the tenth of May and until the last of July. In the Southern States planting begins a month earlier and continues a month later.

Successive plantings should be made about every two weeks until within sixty days of frost.

For the later plantings select the quick ripening varieties.

Varieties.—More than fifteen reliable sorts are fully described in "Burpee's Seed Annual." Among the very earliest varieties we recommend for the family garden, Early Fordhook, Burpee's Golden Bantam and Howling Mob. Highly prized later sorts are Country Gentleman, Mammoth Late, Stowell's Evergreen and Burpee's White Evergreen. The latter is unques-

Early Fordhook Sweet Corn.
(*From a Photograph.*)

tionably the best for the main garden crop. It is very tender, sugary, and remains for a long time in condition suitable for cooking.

### TABLE II.—SWEET CORN.

*Average Number of Days from Planting to First Fair Picking.*

| VARIETIES:— | *Days.* | VARIETIES:— | *Days.* |
|---|---|---|---|
| Adams Extra Early or Burlington, . . . . . . . . | 55 | Early Fordhook,. . . . . . | 63 |
| Black Mexican, . . . . . . | 85 | Early Twelve-Rowed, Crosby's, . . . . . . . . | 68 |
| Burpee's White Evergreen, | 88 | Evergreen, Stowell's, . . | 88 |
| Burpee's Sheffield, . . . . | 68 | Golden Bantam, . . . . | 60 |
| Burpee's Cosmopolitan, . | 65 | Mammoth, Late, . . . . | 95 |
| Cory, Extra Early, . . . | 57 | Minnesota, Early, . . . . | 65 |
| Country Gentleman, . . . | 85 | Burpee's White Evergreen | 88 |

In a favorable and fast growing season the time will be shortened by several days, while in a cold, slow growing season the time would be longer.

☞ To have the finest sweet corn, it must be picked in just the right condition, that is, when the skin of the grain breaks at the slightest puncture, and plantings should be made frequently enough always to have a supply at this stage.

## CRESS—Fine Curled Cress or Pepper Grass

(*Lepidium sativum*).

*One Ounce of Seed will Plant Two Hundred Feet of Drill.* The original home of this hardy little annual is unknown, but by De Candolle it is thought to be a native of Persia.

CULTURE.—Sow thickly in the spring, as soon as the ground is in good working order, and as the plants rapidly run to seed repeat sowings at intervals of about every two weeks. The drills should be from six inches to a foot apart and about one-fourth of an inch deep. Ready for the table from seed in from twenty-one to forty days.

VARIETIES.—Fine Curled or *Pepper Grass* has a pleasant, pungent flavor, somewhat resembling Water Cress.

## WATER CRESS (*Nasturtium officinale*).

*One Ounce of Seed will Sow a Plot Sixteen Feet Square.* A hardy perennial, indigenous to Great Britain and naturalized in the United States.

CULTURE.—It succeeds only in very damp soil on the borders of ponds or streams, or where its roots are at least partially submerged in water. Seed should be sown the same as Fine Curled Cress, along the borders of a running stream, or near the overflow of a spring. A packet or two of seed will usually be sufficient for a family. If planted in suitable soil the plants are rapidly propagated by root extension and self-seeding. May be used in from three to four weeks after sowing the seed.

## CUCUMBER (*Cucumis sativus*).

*From One to Two Ounces of Seed will Plant One Hundred Hills.* There are under cultivation several distinct types of this annual, of which the Common Cucumber and West India Gherkin are the most important.

The original home of the cucumber is unknown, but was probably Northwestern India. The West India Gherkin has been thought by many botanists to be of American origin, but Sir Joseph Hooker thinks it a cultivated and modified form of some African species introduced by the negroes, and like many other plants, naturalized in the new world.

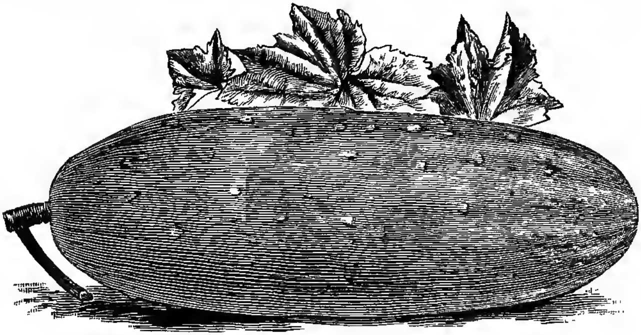
Culture.—A warm, light, sandy soil, rich in organic matter, affords the best conditions of growth for the cucumber.

For very early use sow in the hotbed or greenhouse in February or March, upon upturned pieces of sod six inches square, placed in small boxes, and covered with an inch of very rich, light soil. Plant six seeds on each square of sod, and cover with half an inch of rich soil; place the seed in a vertical position with the germ end down. When the weather is settled and danger of frost over, transplant the contents of each box to the open ground without disturbing the roots of the young plants. Plant in hills six by four feet apart, and previous to setting the plants mix with the soil of each hill a large shovelful of well rotted manure.

Burpee's Giant Pera.

To protect the tender plants from the Striped Cucumber Beetle dust the leaves with land plaster, air-slacked lime, soot or wood ashes mixed with fine, dry, sifted earth. Sprinkling with Paris green in water—a half teaspoonful to a pail of water—is also effective. Poisons should not be used on the vines after the fruits begin to form. For the Cucumber Flea Beetle, powdered tobacco may be dusted over the vines.

After the Striped Beetles begin to disappear thin out to three strong plants to a hill. For a succession sow seed every two weeks in the open garden from the middle of May until the last of July. Plant from six to eight seeds to a hill and thin out to three or four plants. Give frequent but shallow cultivation until the vines have taken possession of the ground. Care should be taken when cultivating or hoeing as well as when gathering the fruits not to bruise or injure the vines, as they are quite tender and are apt to die off if injured in any way. The cucumbers or pickles should be carefully cut from the vine with a sharp knife so as not to twist the vines. Earliest varieties are ready for the table in from fifty to fifty-five days from seed; main crop in from sixty-five to seventy-five days.



Burpee's Extra Early White Spine Cucumber.

Varieties.—All the best sorts are described in "Burpee's Seed Annual." Among those especially worthy of garden culture are Improved Early White Spine or Arlington, Burpee's Extra Early White Spine, Fordhook White Spine, Fordhook Famous, Early Green Prolific or Boston Pickling, Burpee's Giant Pera, London Long Green, Fordhook Pickling and Cumberland Pickling.

## DANDELION (*Taraxacum dens-leonis*).

*One Ounce of Seed will Sow One Hundred Feet of Drill.* A perennial, native to Europe but naturalized throughout America. Though the wild dandelion of our pastures is a troublesome and persistent weed, the forms derived from it by cultivation provide a desirable and wholesome spring salad.

CULTURE.—Sow as soon as the land can be worked, in very rich soil, in drills from twelve to sixteen inches apart. Cover the seed with from one-fourth to one-half an inch of soil, which should be well firmed down with the feet or back of the hoe. Thin out the young plants to from two to four inches apart in the rows. Keep clear of weeds and give shallow cultivation the first season; the plants will be ready to cut the next spring.

The leaves, which are the edible parts, are best when blanched; this is easily accomplished by covering the plants with inverted flower-pots or by placing two boards over the rows, thus Λ. This excludes the light and renders the leaves tender and less bitter. The roots are used as an adulterant for coffee and for medicinal purposes. The Improved Large-leaved Dandelion is a very early variety, which if sown in spring is ready early the next season for use as greens.

## EGG PLANT (*Solanum melongena*).

*One Ounce of Seed will Sow Three Hundred Feet of Drill, or Produce from One Thousand to Two Thousand Plants.* An annual, native of tropical South America, probably Peru, where the wild plant is said to grow in damp or swampy places. The Egg Plant is largely used in all tropical countries as an article of food.

CULTURE.—In the Northern States sow the seed under glass about March first, in finely prepared, moderately rich soil. As the seed germinates slowly and the plant is of tropical origin, it should be started in strong heat, and near the glass, to insure stocky plants. When two or three inches high transplant to four-inch pots or boxes, which keep surrounded by earth. As the days become warmer it is essential to keep the bed shaded from the direct rays of the sun. This is most readily done with frames covered with seed-bed cloth, or by the use of boards. Keep warm and abundantly supplied with moisture until near the time for planting out, when water should be gradually withheld, and the plants exposed to air and sunlight to harden them. About the time for planting Sweet Corn, when the weather has become warm and settled, transfer to the garden. The plants should be set two and a half to three feet apart each way, in soil made very fine and rich; under each plant place a shovelful of rotted manure or rich compost. If the sun is hot shade for a few days, and prevent ravages of the Colorado Potato Beetle by dusting the plants with Paris green. Egg Plant is ready for the table in from one hundred and forty-five to one hundred and sixty days from the planting of the seed.

N. Y. IMPROVED LARGE PURPLE EGG PLANT.

VARIETIES.—Burpee's "Black Beauty" is the earliest and best of all the large fruiting varieties, but truckers in certain localities still prefer the older New York Improved Large Purple.

## ENDIVE (*Cichorium endivia*).

*One-fourth to One-half Ounce of Seed will Sow One Hundred Feet of Drill.* A species of Chicory, of annual duration in America, probably a native of the East Indies. In Europe, where the plant is highly esteemed for culinary purposes, it is a hardy annual and biennial.

CULTURE.—Being a plant of rapid growth and very hardy, Endive can be grown at almost any season. It does best in a moist, well worked and rich soil. Sow the seed thinly in drills one foot apart, and one-fourth of an inch deep, as soon as the soil can be finely pulverized in spring. Thin out to eight inches apart. The plants rapidly run to seed, and if a succession is wanted sow every two weeks until mid-summer.

Another method of planting is to sow seed in narrow drills under glass early in spring, and when the plants are about four inches high transplant to the open ground one foot apart each way. The soil should be firmly compacted about the roots and the plants copiously watered. A cloudy day is best for transplanting, but when the plants are ready set them out and protect from the hot sun with boards or anything affording shade.

Whatever the method of planting keep the surface soil well aërated by frequent hoeings. Before the plants reach maturity gather the outer leaves together over the tops, so as to exclude light and air from the center or heart, and tie with raffia or soft thread. This process of tying up the plants should be done on a clear day when the leaves are perfectly dry, otherwise they will rot. In from two to four weeks the inner leaves will be beautifully blanched and ready for use. A simpler method of blanching is to use boards in the form of an inverted V, thus Λ, for excluding light and air from the plants. For winter use take up before freezing weather, with a large ball of earth attached to the roots and place in a dry cold frame or cellar, away from frost.

Endive makes a delicious salad and is worthy of more general cultivation in the home garden. As an appetizing salad plant it is growing in favor, but in this country is as yet but little grown except by professional market gardeners. It is ready for the table in from forty-three to fifty days from seed.

VARIETIES.—Green Curled is the hardiest. It has ornamental curled leaves of dark green color, which blanch white and crisp.

White Curled is the most beautiful variety; the leaves are not so tender as those of the preceding sort.

Broad-leaved Batavian forms large heads of broad, thick leaves, used for flavoring soups, etc., while if blanched the inner leaves make a fine salad.

## HORSE RADISH (*Cochlearia armoracia*).

*One Dozen Roots will be Sufficient for a Moderately-sized Family.* A hardy perennial, native to the temperate regions of Eastern Europe. In common with many of the Cruciferæ, this plant in its wild condition thrives near the sea, and probably for a thousand years or more has been naturalized on the Western shores of Europe, from Sweden to

Brittany and Spain. The plant is cultivated for its roots, which have the pungent flavor of mustard and are used as a condiment.

HORSE RADISH.

CULTURE.—Horse radish requires a deep, moist and rich soil which should be under the highest state of cultivation. As no seed is produced, the plant is propagated by planting "sets" or pieces of the root. Plant the sets in a slightly slanting position in rows two and a half feet by one and a half feet apart, and cover with two inches of soil. Give thorough cultivation until the leaves completely shade the ground.

To economize when land is limited, the sets are planted in May between early cabbage. In such cases holes are made from eight to ten inches deep and two and a half feet by one and a half feet apart; plant the sets at least three inches below the surface. The deep planting is to retard growth until the cabbage is removed. If planted too early or too near the surface the plants come on before the cabbage is off; in such cases the leaves of the horse radish may be cut off with the hoe without injury. The root makes its chief growth after mid-summer and during autumn.

### KOHL RABI (*Brassica oleracea, Caulo-rapa*).

*One-third of an Ounce will Sow One Hundred Feet of Drill.* Kohl Rabi is a sub-variety of Brassica oleracea, in which, under domestication, the stem above ground is swollen into a symmetrical turnip-like bulb. It is a low growing, bulb-stalked cabbage, or rather is intermediate between the cabbage and turnip, partaking of the characters of both. The plant had its origin in Germany, where it is largely cultivated both for human food and as a forage crop for stock feeding.

CULTURE.—Sowing may be made in the open ground from February to May, according to latitude. For early use in the Northern States, sow in March under glass, in a finely-made seed bed and cover with half an inch of soil; transplant to rich, rather warm garden soil at the same time as early cabbages. Let the rows be two by one and a half feet apart. For a succession later plantings may be made about two weeks apart in the open ground. The plants have a deep root system, which makes them rather difficult to transplant, and besides are liable to receive a check in growth that makes the bulb woody or tough. For this reason it is best to sow the seed in drills 18 inches apart where the plants are to grow, and thin out to six inches. It is useless to plant for mid-summer use, as the bulbs will not develop normal growth in hot weather. For late autumn and winter use sowings may be made at the same time and in the same manner as for late cabbage. For either a late or an early crop give the same general culture as cabbage.

Kohl Rabi.

The bulbs should be used when young and tender. They are prepared for the table in the same manner as turnips, and are a most desirable and delicious vegetable.

Varieties.—Early White and Early Purple Vienna are the best for table use ; Green or White is used both for the table and for stock feeding.

## LEEK (*Allium porrum*).

Broad London Flag Leek.

*One-third of an Ounce of Seed will Sow One Hundred Feet of Drill.* A hardy biennial, of Asiatic or Egyptian origin, by many writers said to be a native of Switzerland. The leek was anciently cultivated but is not mentioned by English gardeners until the middle of the sixteenth century.

Culture.—The leek thrives best in a light, rich, deeply worked soil, and requires about the same cultivation as the onion.

Sow early in the spring, in drills from six to 12 inches apart, and one inch deep. Thin out the young plants to half an inch apart. When about six to eight inches high transplant into rich, mellow soil, in rows 12 inches apart ; set the roots five inches apart and as deeply as possible without covering the center leaves.

To obtain large, finely blanched Leeks a trench may be dug ten to twelve inches deep, on the bottom of which place four inches of rotted manure, and then fill to within three inches of the top with light, rich soil, into which set the roots deeply. As growth proceeds draw the earth to the plants at each cultivation, making a slight ridge on either side, which will effectually blanch the stalks.

Seed may also be sown in September and transplanted in the same manner in early spring.

VARIETIES.—Desirable varieties are Broad London Flag, Long Mezieres and Monstrous Carentan or Scotch Champion. The leaves of the latter are fan-shaped, of a dark green color, and the edible stem six to eight inches long and three inches in diameter.

## LETTUCE (*Lactuca sativa*).

*One-quarter of an Ounce of Seed will Sow One Hundred Feet of Drill, and produce about Four Thousand Plants.* An annual, indigenous to Central and Western Asia, North Africa and Southern Europe. Botanists are agreed that our cultivated varieties have been derived from a wild species, *L. scariola*, still found wild in temperate and Southern Europe, the Canaries, Madeira, North Africa and the temperate regions of Asia.

ICEBERG LETTUCE.

Among cultivated varieties there are two forms, the *Cabbage* and *Cos* Lettuces. The first has nearly round, closely folded leaves, forming low, flattened heads. The second is distinguished by upright growth, and elongated, somewhat spoon-shaped leaves with a large chard-like mid-rib.

The latter is not a heading lettuce, but by tying at the top, the inner leaves are readily blanched. The Cos forms get their name from the island of Cos in the Grecian Archipelago, where these varieties had their origin.

The marked differences in growth between the Cabbage and Cos Lettuces have led some writers into the error of referring our cultivated varieties to two distinct botanical types. "We find it difficult to assent to this view of a twofold origin;" says MM. Vilmorin-Andrieux, "in the first place because the two kinds pass into each other through almost imperceptible gradations; and, secondly, because as soon as they run to seed, they present no difference from each other, which is the most conclusive proof of the identity of their origin." Lettuce is of marketable size in sixty to sixty-five days from sowing the seed, but in the family garden it is fit for use in from three to four weeks from planting.

CULTURE.—To have an unbroken succession of fresh, crisp, and sweet Lettuce throughout the year, it must be grown at home, under glass during winter, and in the family garden at other seasons. A rather heavy, rich and moist soil is essential to rapid growth, and quick growth is necessary to develop tender, appetizing lettuce.

For early spring use sow thinly under glass in February, and cover very slightly with not more than one-fourth of an inch of fine soil.

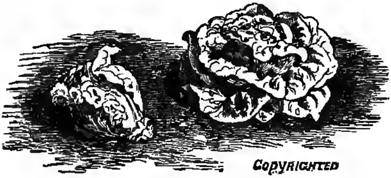
Keep at a moderate heat and give fresh air whenever the temperature will permit. Transplant to from one to three inches apart in the beds, or into small boxes or pots, which keep imbedded in earth. Transplant to the garden in rich, deeply worked soil, as soon as spring work begins. Set out in rows eighteen inches by six inches apart. When the plants begin to crowd each other, take out the alternate ones for use. A second sowing should be made in the open ground at the time the first plants are set out, and for a succession sow seed at intervals of every two or three weeks throughout the summer.

DWARF WHITE HEART COS LETTUCE.

Lettuce grown during spring and autumn will be more crisp and tender than that grown in mid-summer. However, if a piece of moist ground is at hand, and if the plants are not exposed to the full heat of the sun, sweet, tender lettuce may be grown even during mid-summer. For this purpose make a screen of laths, nailed on a light frame the width of the laths apart; to this frame have pointed legs from 30 to 36 inches long, which press down into the earth over the bed. This screen will give ample protection from the hot sun.

For a supply in November and December plants may be set in a cold frame the last of October and protected with sash when there is danger of freezing.

For a mid-winter supply sow the seed thinly in the hotbed or greenhouse and transplant to four inches apart each way in the bed and thin out as wanted, which will give the remaining plants plenty of room. A method which has met with much success is to transplant into four-inch pots which are imbedded in soil. The hotbed should be so located as to get the full benefit of sunlight and be protected from north winds. There should be an air-space of at least one foot between the soil and the glass. Water sparingly but give fresh air whenever possible without chilling the plants.



TOM THUMB LETTUCE.

VARIETIES.—More than thirty varieties adapted to garden and hotbed culture are fully described in "Burpee's Seed Annual."

In BURPEE'S ANNUAL lettuce is classified under five types—Earliest and Forcing, "Loosehead" or Cutting, Butterhead, "Crisp-Head" and Cos; but to avoid confusion it should be borne in mind that a majority of the varieties offered under the headings "Earliest and Forcing" are of the Butterhead type.

The principal forcing varieties are the two Tennis Balls, Tom Thumb, Burpee's Earliest Wayahead and May King. In the West the Grand Rapids is most popular for growing under glass.

All the "Loosehead" or Cutting varieties are popular in certain localities, but the favorite is Early Prize Head, which frequently makes quite a large loose head.

Among the best Butterheads are The Deacon, All Seasons, California Cream Butter, Salamander and Burpee's Butterhead.

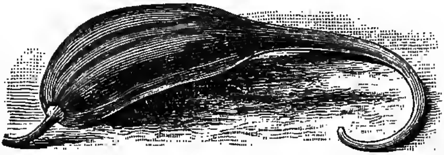
All the "Crisp-Heads" are popular, but the finest of all is Burpee's Iceberg. This variety produces heads that are always crisp, brittle and mild in flavor,—the best for summer use.

Among the Cos Lettuces the Eclipse and Dwarf White Heart are the best, provided a small or medium sized head is desired; the Paris White produces large heads which are easily blanched.

## MARTYNIA (*Martynia proboscidia*).

*Half an Ounce of Seed to One Hundred Hills.* A hardy and half-hardy annual, indigenous to Southern Illinois and the lower Mississippi valley. The seed-pods when young and tender, are used for making pickles, the same as cucumbers.

CULTURE.—Plant the seed during April or May in rich, warm soil, in hills three feet apart each way. The seed germinates slowly, and plants will not appear until the ground is quite warm. Leave but one stocky plant to a hill. Ready for use in from sixty to eighty days.



A SEED-POD OF MARTYNIA.

## MUSHROOMS (*Agaricus campestris*).

☞ Would caution amateurs against attempting to grow mushrooms on a large scale as we know of no other crop which requires so much expert knowledge to make the venture profitable,—it is an established fact that even the most experienced growers frequently suffer heavy losses on account of the failure of their crops.

*One Brick will Spawn about Ten Square Feet of Bed.* This, as well as many other species of edible fungi, is common in nearly every habitable part of the globe, and for the past 2500 years has, in some countries, been classed with the most rare of vegetable products. The French have grown mushrooms very extensively for many years and distributed them in cans, as we do most of our standard vegetables. In this country mushrooms are now being extensively grown for market purposes, in greenhouses, cellars, or underground rooms, built expressly for this purpose.

The modern methods of growing mushrooms have become so simplified that they can be easily grown at all seasons of the year, either in the greenhouse, shed, or cellar, with but little trouble, providing a good supply of horse droppings can be had. But in the house cellar we do not advise their cultivation, as their growth is accompanied, in a great degree, by the decomposition of vegetable matters, the gases arising from which are by no means conducive to health. In a shed, where the temperature can be kept even, say at from 50 to 60 degrees, mushrooms can be easily and profitably grown.

The making of a mushroom-bed is a simple matter. The first step is to procure good stable manure, with but little long straw, sufficient for the size of the bed required; let it remain in a heap for about a week, then carefully turn it over, so it will become evenly mixed; repeat the operation three times, at intervals of three days each. Care should be taken at each turning to thoroughly incorporate the outside with the middle of the heap; this is to insure sweetness and even moisture. After being turned over three times, if it still retains a strong smell, another turning should be given, which will put it in a good condition for making into a bed. Manure should be always prepared under a shed, or in some place where there is no possibility of its getting wet. After the manure is prepared in this manner it is generally considered best to mix with it about one-third of its bulk of fresh loam from the field or meadow that has not been recently manured; but many successful growers make up the bed without any mixture of soil. As both methods are productive of good results, it shows that either method is good, and that success depends upon other conditious.

MUSHROOM-BED ON MANURE AND LIGHT LOAM.

We prefer a slight mixture of loam, say one-fourth of the bulk, and in preparing the bed use the utmost care in mixing, in order to prevent overheating. Beds are made from eight to fifteen inches in depth; the latter depth we think desirable to retain longer a moderate heat. Pack the material firmly, and as put in, leaving the surface even, and either somewhat rounded or sloping. When the bed is completed plunge in a thermometer, which should soon indicate a temperature of 100 degrees Fahrenheit or over; it will soon begin to decline, and when it falls to 85 or 90 degrees lay out the bed in squares of twelve inches, and with a dibble make holes four inches deep, into which put a piece of spawn about one inch square, covering up the hole again with the compost, so it will present the same even appearance as before the spawn was put in. Nothing further will need to be done, for ten or twelve days, by which time the spawn will have "run" through the whole bed. Then there should be spread evenly over the whole bed about two inches in depth of fresh loam, which should be thoroughly firmed down with the back of the spade, and cover up the bed with three or four inches of straw or hay, which completes the work of planting, and there is nothing further to be done, but to attend to the proper degrees of heat and moisture.

Extremes of heat, cold, draught and moisture, should be avoided in the cultivation of mushrooms.

## MUSK MELON (*Cucumis melo*).

*One to Two Ounces of Seed to One Hundred Hills.* An annual, native to the warmer regions of Asia and probably to northwestern Africa. De Candolle thinks *C. melo*, was, at a remote period, wild from the west coast of Africa to India.

A wild plant is yet found growing on the sandy lands of the Niger in Guinea, and the fruit, which is ovoid and no larger than a plum, is eaten by the negroes; this, he thinks, is derived from the same parent form as a wild variety, with fruit varying from the size of a plum to a lemon, found in British India and Beloochistan.

EMERALD GEM MELONS. (*From a Photograph.*)

The Cantaloupe derives its name from Cantelouppi, an estate near Rome belonging to the Pope, but had its origin in Armenia. The green-fleshed melons or citron and the nutmeg varieties have a common origin in the African or Egyptian melon.

CULTURE.—The most congenial soil for melons is a warm sandy loam, well worked and enriched with old compost.

Plant in very slightly raised hills four to six feet apart each way; place the seeds about two inches apart, one inch deep and from eight to twelve in a hill. A shovelful of old compost or rotted manure should be placed in the bottom of each hill. Planting in the garden should be delayed until all danger of frost is past,—about the time for planting sweet corn—when the ground has become warm and moderately dry, is the proper time.

When the young plants are no longer in danger of being destroyed by insects, thin out to three vigorous plants to a hill. Cut off the surplus plants just below the surface so as not to disturb the roots of those remaining. Keep the surface loose by shallow hoeing, but in no case disturb the roots, and never work the ground when the leaves are wet with dew or rain. When about one foot long pinch off the end of the main shoot, which will cause the vine to put forth lateral branches and induce earlier fruiting.

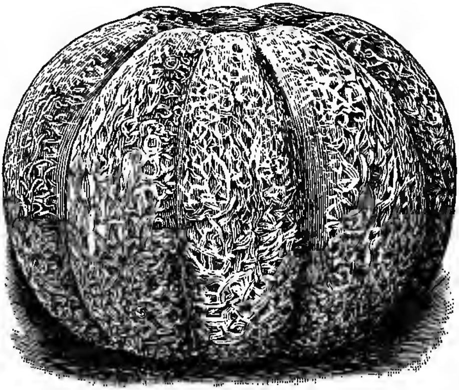
New Long Island Beauty Melon.

The best melons grown in the home garden are usually from seed sown in the hotbed in pots or on inverted pieces of sod, the same as cucumbers. The sash should be removed only on clear, warm days, and never in cool or cloudy weather. Give plenty of ventilation, which is afforded by raising the sash about two inches above the frame. Keep the soil moist, but provided with good drainage. To prevent burning give the glass a light coating of oil and turpentine,—one part oil to five parts of turpentine, or cover the frame with plant cloth. Earliest varieties are ready for the table in from ninety to one hundred days, and the general crop in from one hundred and fifteen to one hundred and forty days from planting the seed.

Varieties.—Among the many varieties we suggest the following for the home garden: Burpee's Netted Gem, Emerald Gem, Long Island Beauty, Montreal Green Nutmeg, Burpee's Champion Market, Burpee's Fordhook, Burpee's Spicy, and Burpee's Melrose.

Burpee's Netted Gem was first named and introduced by us more than thirty years ago. In shape this melon is rather oblong or oval, with green skin, regularly ribbed, and thickly netted. The melons grow remarkably uniform in size, weighing from one and a quarter to one and a half pounds. The flesh is thick, light green in color, and of fine, luscious flavor. Of recent years this variety has become very popular under the name Rocky Ford.

Emerald Gem since its introduction has been considered the richest in flavor of all salmon-fleshed varieties, but we now have even a finer sort in Burpee's Fordhook.



BURPEE'S NEW "FORDHOOK" MUSK MELON.

Montreal Green Nutmeg is the variety sold in New York at such high prices late in the fall.

Burpee's New Fordhook has been pronounced equal to Emerald Gem in delicious flavor. It has a rough netted skin and solid, thick, salmon flesh, making it one of the best varieties for shipping.

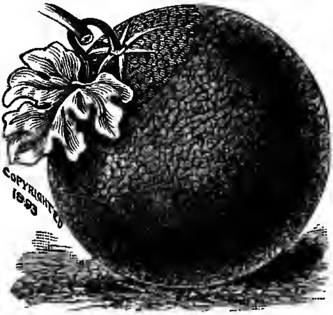
Burpee's Spicy Cantaloupe is of vigorous growth and wonderfully prolific, producing melons averaging nine inches long by six inches in diameter. The flavor more nearly approaches the foreign varieties grown under glass than any other outdoor sort.

## WATERMELON (*Cucurbita citrullus*).

*Four Ounces of Seed to One Hundred Hills.* An annual, native to tropical Africa and probably cultivated for more than 4000 years. For ages it has been grown in the valley of the Nile and throughout Southern Asia. Dr. Livingstone saw entire districts in Africa covered with the wild watermelon, and reports that the savages and several wild animals eagerly devoured the fruit.

Culture.—Rich, rather sandy soil should be selected if possible but if this is not to be had a well drained piece of loam, preferably with a southern exposure, will produce fair watermelons. Cultivation is about the same as for Musk Melons, but differs mainly in that watermelons being of larger and stronger growth, require to be planted a greater distance apart. To secure strong plants early in the season make large, well drained hills from eight to ten feet apart.

Two large shovelfuls of rotted manure or compost should be mixed with the soil of each hill and so worked in that there will be no injury to the young vines from quick drying under hot suns. When the soil is warm and comparatively dry plant on each hill from eight to twelve seeds, about three inches apart and from one to one and a half inches deep. Set the seeds edgewise with the eyes down.

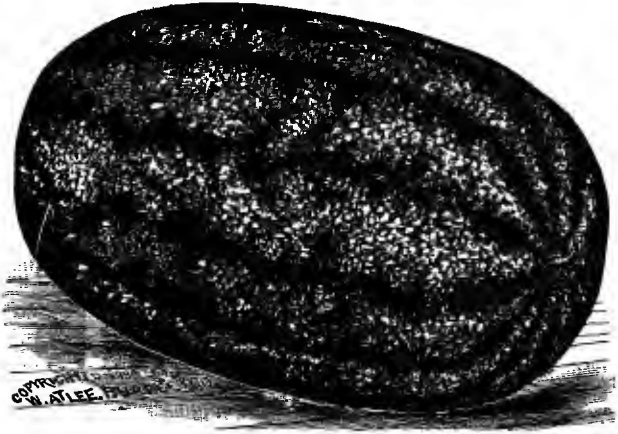


Hungarian Honey Watermelon.

Protect the young plants from insects with netting, or by the use of dry sifted ashes sprinkled over the leaves when wet; hasten growth by frequent applications of manure liquor, such as is recommended for cauliflower (see page 46). Thin out to form one or two strong plants to each hill. The vines will fruit more abundantly by pinching off the leading shoots in the same manner as with Musk Melons. Early Fordhook is ready for the table in from ninety to one hundred days; the general crop in from one hundred and twenty to one hundred and forty days from planting the seed.

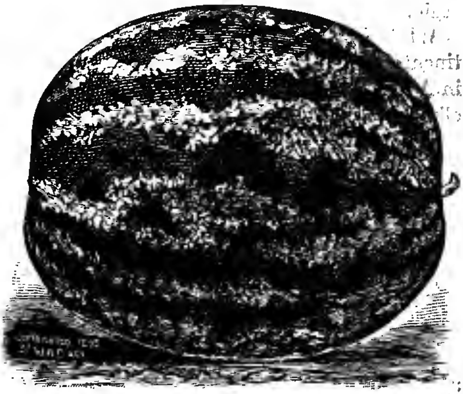
Varieties.—Among many good varieties we suggest for the family garden, Fordhook Early, Kleckley Sweets, Dixie, Halbert Honey, Burpee's Hungarian Honey, and the Mammoth Iron Clad.

Recent introductions are Tom Watson, "Sugar Stick," Halbert Honey and Shaker Blue.



Burpee's Mammoth Ironclad Watermelon.

For an extra early watermelon Fordhook Early undoubtedly stands first. From seed planted May tenth, large ripe melons have been picked the last week in July. The outer color is a uniform medium green, seeds white, flesh bright red, and very sweet. The average weight of the melons even during an exceptionally bad season, was thirty-five pounds each. Burpee's Hungarian Honey is a small, surpassingly sweet, and luscious melon, with rich, honey flavor. The



New Watermelon.—Cole's Early.

fruits ripen early and the vines are very prolific. The Dixie possesses the rich, luscious flavor of the old Mountain Sweet united with the excellent shipping character of Kolb's Gem; the flesh is bright scarlet, very tender and juicy. It has the valuable characteristic of rooting at almost every joint, thereby increasing the duration of the vine.

The McIver Wonderful Sugar Melon is claimed to be superior to the Georgia Rattlesnake, which has been so long the favorite melon in the South. The size is uniformly large, many specimens being two feet in length, and quite a number of even greater length, while they average from 10 to 14 inches in diameter. They present a handsome appearance, the skin showing broad bands of white, shading into narrower bands of dark green; the flesh is of a soft, pale pink, crisp, free from any stringiness (even in an unfavorable season), juicy, and of luscious sweetness.

Preserving Melon, or Citron.—Give the same general culture as the watermelon. The Colorado is the best for preserves.

For a concise treatise on Melon Culture, see our little book, "Melons For Profit," compiled from the Prize Essays and our own experience.

## MUSTARD (*Sinapis*).

*One Ounce will Sow Fifty Feet of Drill.* A genus of hardy annuals, probably indigenous to the Mediterranean Basin, found growing wild in temperate and Southern Europe, North Africa, and the temperate regions of Western Asia.

White Mustard, *S. alba,* is universally grown by English and Continental gardeners, for use as a salad, but the plant is almost unknown in American gardens. This is probably due to the fact that in our climates the leaves are more pungent and less fleshy, and unless used when very young do not make the agreeable salad produced from the same species when grown on the other side of the Atlantic.

Black Mustard, *S. nigra,* as well as the former species, is naturalized in this country; both are common wayside weeds.

Culture.—Sow thickly in shallow drills from three to six inches apart, and for a succession at intervals of every few days during spring. Cover lightly and press the earth well down on the seed.

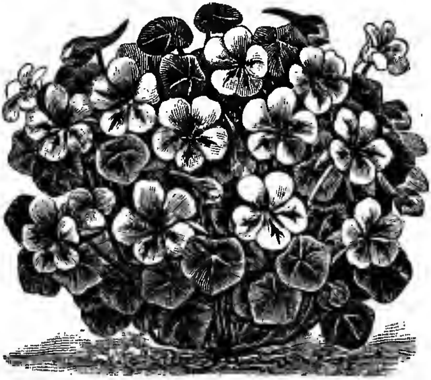
When from one to two inches high the plants may be cut for salad, or boiled like sprouts or spinach. If cut just when the second leaves appear they make a slightly pungent and wholesome salad.

Varieties.—White, New Chinese and Southern Giant Curled are highly esteemed. Fordhook Fancy produces beautiful, finely cut, dark green leaves, and is delicious when cooked like spinach.

## NASTURTIUM (*Tropæolum*).

*Two Ounces of Seed will Sow One Hundred Feet of Drill.* A genus of exceedingly ornamental annuals and perennials, native to tropical South America. Two distinct species of perennial habit in their native country, Peru, are common with us, where they are of annual duration, and are notable for the varied range of colors and the brilliancy of their flowers. These are the Climbing (*T. majus*) and the Dwarf Nasturtium (*T. minor*), embracing many varieties.

The flower-heads and young leaves make a pleasing salad, while the seed-pods when green and tender are pickled as a substitute for capers.



TOM THUMB NASTURTIUM.

CULTURE. — Nasturtiums thrive best in a warm, not over-rich, sandy or gravelly soil. Sow seed thinly in drills about one inch deep at the same time for planting sweet corn and melons.

The climbing sorts should be sown in drills two feet apart, by the side of a fence or some other support for the rampant growing vines to run over, thin out the young plants to eight inches apart. For Dwarf varieties the drills should be one foot apart; these require no supports, bloom earlier and are the best for culinary use.

## OKRA or GUMBO (*Hibiscus esculentus*).

*From One to One-and-a-half Ounces of Seed will Plant One Hundred Hills.* An annual, of African origin, the mucilaginous seed-pods of which are used when young, in soups, sauces, etc.

Most English and American writers, following the errors of earlier botanists, state okra to be a native of the West Indies and Central America. According to De Candolle the plant is undoubtedly of African origin. Flückiger and Hanbury have shown that it was cultivated in Egypt nearly three centuries before the first voyage of Columbus.

The plant is found wild and is also cultivated in the valley of the Nile, Abyssinia, Nubia, and in other parts of tropical Africa.

There can be little doubt but that the seed was brought to the West Indies or neighboring Continent probably with the introduction of slavery into the Colonies. The creoles of the West Indies not only use the tender pods for culinary purposes, but also the ripened seeds, which are roasted and used as a substitute for coffee.

WHITE VELVET OKRA.

CULTURE.—In the northern states plant late in the spring in rich, warm, rather dry soil, in hills or drills two and a half feet apart. Cover the seed with from one to two inches of fine soil and when the plants are established thin out to from twelve to sixteen inches apart. Keep the soil well hoed and at times draw a little earth about the stalks to support them. If an early supply is wanted, plants may be started under glass in March or April and transplanted to the family garden after the weather becomes settled and the ground moderately warm.

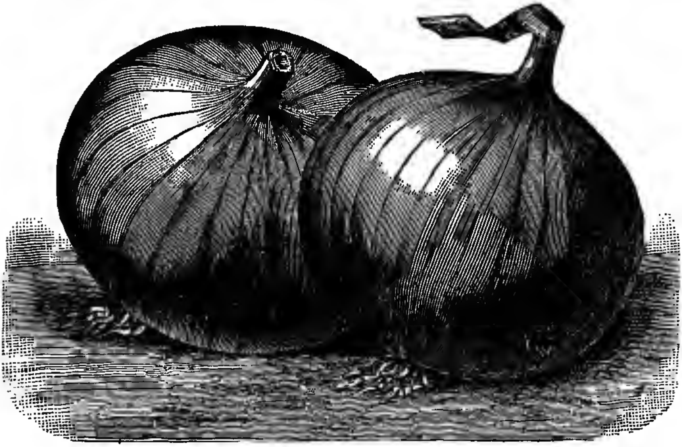
In the southern states early and late plantings are advisable if an uninterrupted succession is wanted throughout the season. In the north a single sowing is sufficient to provide an abundance until frost.

The seed pods when young and tender may be cut in thin slices, strung upon thread and dried in the shade in the same manner as domestic fruits. When thus cured they may be stored away for winter use. The pods will be ready for use in from ninety to one hundred and five days from seed. The dwarf varieties only should be grown in the garden.

VARIETIES.—New Lady Finger, Dwarf Prolific or Density, and White Velvet are suitable sorts for the family garden. This vegetable is deserving of more general cultivation. It imparts a fine flavor and consistency to soups and is, besides, very palatable when stewed like asparagus. The flowers are exceedingly ornamental, resembling the Hibiscus, to which genus the Okra belongs.

### ONION (*Allium cepa*).

*For Large Onions One-third of an Ounce of Seed to One Hundred Feet of Drill. For Onion Sets One Ounce of Seed to One Hundred Feet of Drill. One Quart of Sets will Plant One Hundred Feet of Row.* A biennial and sometimes perennial, probably indigenous to Central or Western Asia, from Palestine to India.

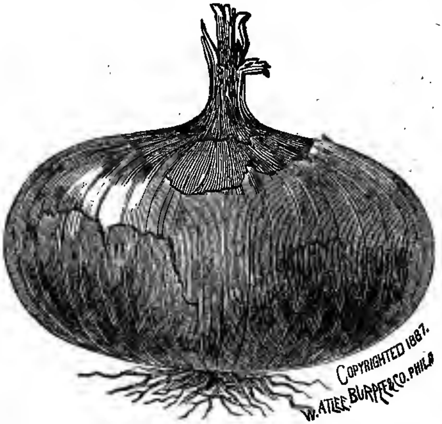


YELLOW GLOBE DANVERS ONIONS.

The history of the onion is lost in antiquity. It was probably cultivated in Southern Asia and the Eastern Mediterranean Regions at an epoch antedating human history. Drawings of the onion are found on the monuments of the ancient Egyptians, from whom one variety received divine honors. Herodotus mentions an inscription on the Great Pyramid of Cheops to the effect that 1600 talents had been paid for onions, garlic, and radishes, consumed by the workmen. This, the first and largest of the pyramids, is believed to have been begun in 4235 B. C.

The onions mentioned by the early Spanish adventurers in Mexico and Peru, and thought by many writers to have belonged to native species, are believed by the best authorities to have been of European origin. Species of this genus are rare in America.

Culture.—Onions can be successfully grown on almost any soil. Some varieties do best on heavy and others on light land, but the question of soil adaptability is of secondary importance so far as the home garden is concerned. A spot inclined to be moist will yield the largest returns, and such a bed, if there be one in the garden, should be selected. Get the soil into proper condition during autumn. Dress heavily with fine rotted manure, and to this fine bone meal and wood-ashes are most valuable additions. Clear or burn off all rubbish before applying the manure, which should be spaded in just under the surface, or the land may be plowed, but if this is done, take a narrow, shallow furrow. This exposure to the freezing and thawing, and to the weathering action of the atmosphere will improve the tilth of the toughest soil. Early in spring go over the bed with a heavy harrow or the wheel hoe and then cross-work it with the same implement. If the bed can then be reached over without much tramping, the writer prefers to cover the surface with a moderately thick layer of dry straw, which is then sprinkled with kerosene oil and burned. The intense heat produced will destroy the vitality of all weed seeds within an inch or two of the surface, and save much future labor. Then rake the bed with a fine steel rake until the soil is perfectly fine and level. This work should be done as early in the spring as the land can be worked.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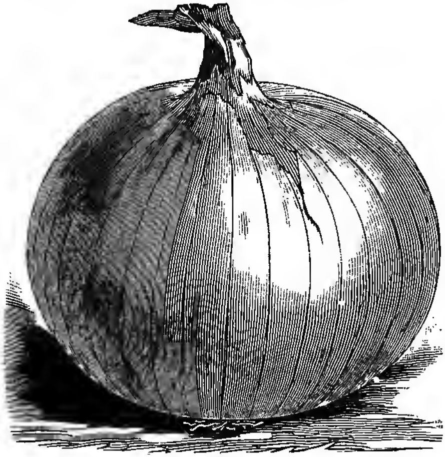
W. ATLEE BURPEE & CO. PHILA

Large Red Wethersfield.

Sow the seed in perfectly straight rows ten inches apart and from one-fourth to one-half an inch deep. The hand seed drill is the best implement for this work, but before use should be adjusted to sow the seed thinly as required. Cultivate with a thin, narrow-bladed hoe as soon as the young plants appear. When two inches high thin out the plants to four inches apart. The several patented wheeled implements are excellent for use in onion culture, as well as for all other garden vegetables, and these are now sold at such low prices that every one can afford to own them.

Cultivate at least twice a week during the first month, and pick out any young weeds in the rows as fast as they appear ; but in removing weeds do not disturb the roots of the young plants. Pickling Onions, like the Early White Queen, mature in from one hundred to one hundred and sixteen days; the main crop requires from one hundred and thirty to one hundred and sixty days from seed to maturity.

If the crop is for very early table use, it is best to plant small onion sets instead of the seed. Some quick acting fertilizer, like poultry manure or nitrate of soda, may also be used to advantage ; if the nitrate is used it must be applied lightly and raked just under the surface, or a few pounds may be dissolved by mixing with damp sand, after which, scatter over the bed or along the rows. 100 pounds of nitrate of soda per acre is sufficient. This is less than one-fourth of a pound of nitrate to 100 square feet of bed.



Large White Globe Onion.

Plant the sets in shallow drills two inches wide and from ten to twelve inches apart.

The Italian onions are frequently grown by sowing the seed in August and wintering the young plants in trenches covered with straw or leaves. These trenches should be on well drained land where water will not stand during winter. Transplant in the spring in the same manner as other onion sets In the north a very early supply may be had by sowing seed in the hotbed in February and transplanting to the garden as soon as early spring weather will permit.

For complete works on onion culture the reader is referred to our book, "Onions For Profit," by Mr. T. Greiner, the successful grower of Onions under new methods.

Complete descriptions of the leading American and Italian onions are given in "Burpee's Seed Annual."

AMERICAN VARIETIES.—The Yellow Globe Danvers is not only one of the best early maturing onions for the home garden, but is a profitable and popular onion to grow for market. The Yellow Strasburg or Dutch is one of the oldest varieties in cultivation; the bulb is quite flat, the skin yellow, but darker than the Danvers; flesh white and of mild flavor. This variety is used for growing Philadelphia Yellow Onion sets. Extra Early Red yields abundantly and is of mild flavor. It matures very early, and will often form bulbs in cold, mucky soils where other varieties fail. It is particularly recommended for the North and Northwest. The Large Red Wethersfield is very productive and an excellent keeper. It is of large size and fine form, skin deep purplish-red; flesh, purplish-white. The White Silver-skin, or White Portugal, is of mild, pleasant flavor, highly esteemed for pickling when young; the skin is silvery white and of handsome appearance. The American-grown Prizetaker is of a nearly perfectly globe shape, with thin skin of bright straw color; it is of immense size, measuring from twelve to eighteen inches in circumference, while under special conditions of culture, bulbs have been raised to weigh five and a half pounds. The flesh is pure white, fine-grained, mild and delicate in flavor. New Gigantic Gibraltar Onion, while similar in appearance to the Prizetaker, is lighter in color and of more globular form. In the prize

PRIZETAKER ONION.

competition of 1895 the Prizetaker retained first place for size, but the Gibraltar developed pronounced good qualities and excited astonishment, not only for its large size, but for shapeliness and handsome appearance.

ITALIAN VARIETIES.—The Barletta is the earliest onion in cultivation. At maturity the tops die down, leaving neat, handsome little bulbs, from one inch to one and a half inches in diameter. Its extreme earliness and fine quality make it a favorite in every garden.

In the middle west there are annually hundreds of acres planted with seed of White Queen or Extra Early Barletta to produce the small pickling onions for which there is a very heavy demand. Pickling establishments throughout the United States have found this type of onion to be the very best for pickling either alone or as a component part of chow-chow. It is early, and the bulbs being of a pure paper white makes it a most desirable variety. Burpee's Mammoth Silver King was named and introduced by us in 1884. The skin is a beautiful silvery white; the flesh is snowy white, tender, and of a particularly mild and pleasant flavor; the average diameter of the onions is from five to seven and a half inches.

**Onion Sets.**—For these the land need not be so heavily fertilized, but it cannot be too fine or thoroughly prepared. The seed should be sown thickly in drills ten inches apart; cover very lightly with not more than one quarter inch of soil, which press firmly down on the seed bed. Small, globular onions are desired, and to obtain these no thinning out is needed. Keep entirely free from weeds. Onion sets are ripe in August and should then be taken up and stored in a dry, cool place. Shallow trays with lattice bottoms made of laths are best for this purpose.

POTATO ONIONS.

**Potato Onions, or Multipliers,** are readily grown for an early crop; they are liable to some diseases, but are not so liable to be destroyed by the onion maggot.

They are propagated by division; the large bulbs when planted divide into clusters of small ones, and these in turn develop into large bulbs. They are mild flavored and easily grown.

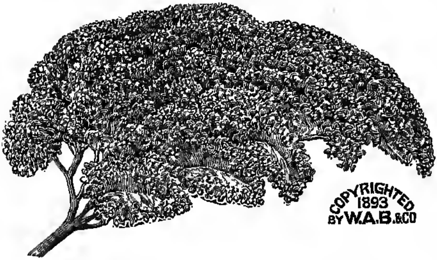
Plant in drills four inches apart. The largest bulbs should be placed six inches asunder and the smaller ones from two to three inches.

Varieties for the garden are: Philadelphia White, Philadelphia

Yellow, Potato Onions, White Multiplier, and Egyptian, or Perennial Tree Onions.

## PARSLEY (*Apium petroselinum*).

*One-fourth of an Ounce of Seed to One Hundred Feet of Drill.* A biennial. Found wild in the South of Europe, in Algeria, and in the Mountains of Lebanon. This plant has probably come under cultivation since the beginning of the Christian era. It is mentioned as having been grown in the gardens of Charlemagne, and was probably in general cultivation during the Middle Ages. English gardeners are said to have obtained the plant from Sardinia and to have introduced it into England during Queen Elizabeth's reign, in 1548.



NEW EXTRA DARK MOSS-CURLED PARSLEY.

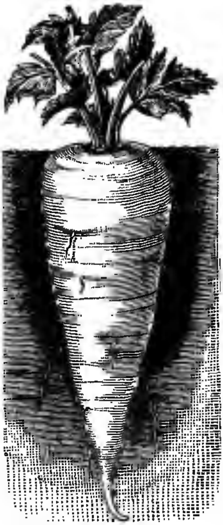
CULTURE.—The seed is one of the first to be sown in the spring, as it frequently fails to germinate if sown after the soil becomes dry. Sow in drills half an inch deep and one foot apart; thin out to six inches apart in the rows as soon as the plants have made a second pair of leaves. For a summer crop the soil cannot be made too fine or mellow.

For an early spring crop the seed should be sown about the first of September, but the ground should not be made very rich, as a steady rather than a rapid growth is more essential. Upon the approach of cold weather scatter newly fallen leaves around the plants, nearly up to their tops, and keep in place with evergreen boughs or light brush.

VARIETIES.—The Extra Dark Moss-curled Parsley is a distinct, ornamental strain. The leaves are beautifully curled or crimpled and of extra dark-green color. It is very productive, and from the densely curled character of the leaves and the delicacy of its flavor is the best for border plants in the garden. Extra Curled Dwarf, or Emerald, Fern-leaved and Turnip-rooted, or Hamburg, are also suitable varieties for the garden. The edible part of the Turnip-rooted, or Hamburg, is the fleshy root, which resembles a small parsnip, and is esteemed for flavoring soups, stews, etc.

## PARSNIP (*Peucedanum sativum*).

*One-fourth of an Ounce of Seed to One Hundred Feet of Drill.* A hardy biennial found wild in Great Britain, Central and Southern Europe, and naturalized in the United States.



IMPROVED GUERNSEY PARSNIP.

CULTURE.—The parsnip is of easy cultivation, preferring a deep, rich, moist, but rather sandy soil. The ground in the garden should be spaded deep in order to furnish long and well-formed roots. If manure is used it should be old and finely rotted, but the plant is not exhaustive, and the soil is in best condition for parsnips after having been made very rich for a previous crop.

Sow the seed in spring as early as the ground can be made ready. Sow in drills from a half to one inch deep and ten inches apart. A good plan is to sow radish seed with the parsnip, in the proportion of three to one. The radishes will be ready for use before the parsnips require much thinning out. However, in thinning out, carefully firm the earth around the remaining plants.

If the soil is very shallow the Early Round French Parsnip may be grown to advantage. There is no difference in qualities between the long and short round varieties if well grown. Parsnips mature from seed in from one hundred and twenty-five to one hundred and forty days.

Early frosts do not injure the tops or roots and the table qualities are improved by frost. Dig just before the ground freezes up for the winter. Do not cut the roots or trim the tops too closely. Store in a cool, dry cellar, and cover with dry sand to exclude the air.

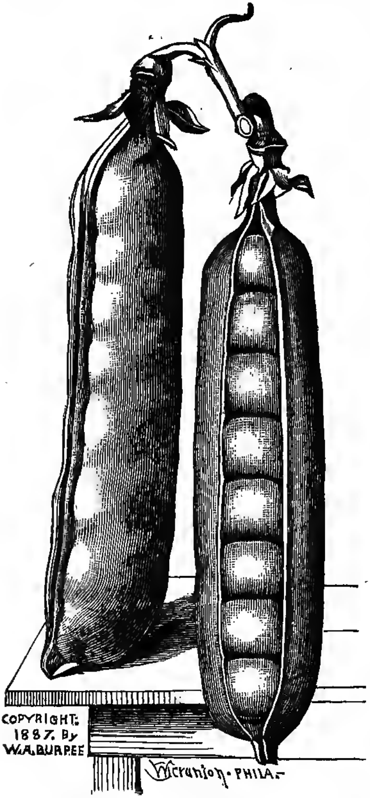
Parsnips are well known as a delicious table vegetable, but their value for the purpose of feeding cows and cattle is but little appreciated. The parsnip is rich in saccharine food, which adds greatly to the richness of the milk when fed to cows, while the fresh, succulent roots increase the flow of milk as greatly as does the use of fresh green food in the spring. The parsnip is especially valuable for the purpose, from its extreme hardiness, as the roots can be left in the ground all winter and improve in quality by the continued freezing.

VARIETIES.—The Improved Guernsey or Improved Half Long is recommended for the garden.

## GARDEN PEAS (*Pisam sativum*).

*One Pint of Seed will Plant One Hundred Feet of Drill.* An annual of uncertain origin, but thought to be indigenous to Western Asia in the regions South of the Caucasus, to Persia and Northern India. Seed has been found among remains in the lake dwellings of the Age of Bronze in Switzerland, and by the Geologist Dr. Heer, among relics of the Stone Age. The seed of the pre-historic species is spherical and smaller than our modern garden peas.

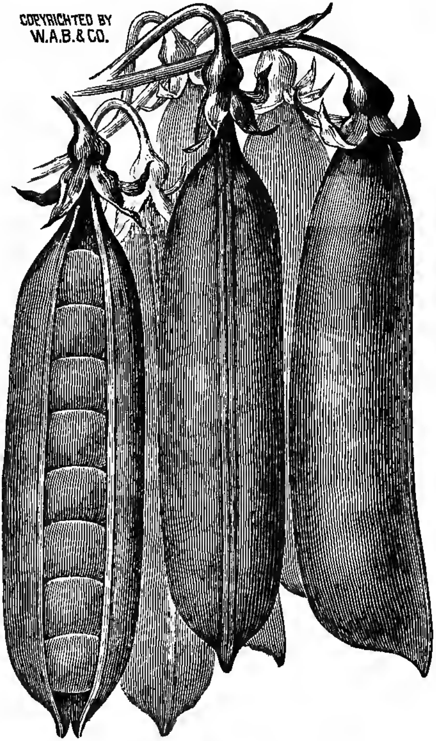
The date of its introduction into English gardens is unknown, but in the thirteenth Century the pea was cultivated in England. The quality of the pea has been greatly improved by cultivation. The kinds now common in our gardens are so superior to those grown fifty years ago as to be scarcely distinguishable as belonging to the same species. We now have two distinct forms, first, Smooth or Round Seeded, and second, Wrinkled Peas. Several of the former, known as Sugar Peas, have edible pods. The Wrinkled varieties are the earliest, very productive and remain longest in bearing.



BURPEE'S QUALITY.

CULTURE.—The pea can be grown in every garden, but for earliness, a light, warm, moderately rich soil is most suitable. If manure is used at all it should be fine and thoroughly rotted. The first sowing should be made as early as the ground can be worked; and for a succession plant until June first. Occasionally a good crop can be obtained by planting in one long double row, six inches apart. Drop the peas from two to three inches apart. If practicable plant in rows running north and south. In productive soil a vigorous growth will completely cover the supports whether of brush or wire-netting. For tall varieties, brush well furnished with twigs makes a better support than wire-netting. If several double rows are planted they should be six feet apart.

For very early varieties cover with one inch of fine soil. This, however, only applies to the earliest sorts. The Pea loves moisture and has a deep root system. The largest yield and most luscious flavored peas are obtained by planting in trenches six inches deep. Cover the seed first with from two to three inches of soil and as growth proceeds fill in with earth until the trench is level with the surface. Keep well cultivated. Another method of planting is to sow in single rows three feet apart for early and four feet apart for late sorts.



NOTT'S EXCELSIOR PEAS.

VARIETIES.—The small, round, extra early Pea is more largely grown, both in the family garden and for market, than any other one type, and each seedsman naturally strives to have an extra selected strain of so important a variety. Burpee's Best Extra Early, a selected strain introduced by us in 1889, is unsurpassed, authentic reports having been received where the Peas have been ready for the table in thirty-four days from date of planting. Laxton's Earliest of All is also a small-seeded round Pea, but the dry seed is blue in color instead of white.

Wrinkled Peas are noted for their sweetness and rich sugary flavor. The most popular varieties are the Extra Early Premium Gem, which grows about sixteen inches high and the Dwarf American Wonder, which grows only eight to ten inches high. Recently, however, there has been introduced two new varieties that will surpass even the famous American Wonder. The Little Marvel is fully as early, while the vines are more productive. Nott's Excelsior, although perhaps not quite so early as the American Wonder by a few days, is valuable, from the fact that all the Peas are ready for picking at one time. As shown in the illustration on page 83, the pods are very compact, well filled with six or eight large peas, and they are of unusually sweet flavor.

For General Crop.—There are many good Wrinkled Peas for the general crop, but in our opinion none can equal Burpee's Quantity and Quality Peas and Bureee's Profusion, all three of which are fully described in Burpee's "Annual."

## TABLE III.—PEAS.

*Days from Planting to First Fair Picking, and Length of Vines in Field and Garden Culture.*

| Varieties. | *Days From Planting to First Fair Picking.* | *Length of Vines with Ordinary Field Culture.* | *Length of Vines with Garden Culture.* |
|---|---|---|---|
| Advancer, McLean's | 59 | 24 to 28 | 26 to 30 |
| Alaska | 50 | 20 to 24 | 24 to 28 |
| Alderman | 75 | 40 to 48 | 45 to 50 |
| American Wonder | 50 | 9 to 10 | 10 to 12 |
| Best Extra Early, Burpee's | 36 to 46 | 20 to 26 | 24 to 30 |
| Black Eye Marrowfat | 84 | 48 to 56 | 54 to 60 |
| Boston Unrivaled | 72 | 36 to 34 | 40 to 50 |
| Carter's Daisy | 75 | 20 to 26 | 24 to 28 |
| Champion of England | 78 | 40 to 48 | 46 to 54 |
| Dwarf Gray Sugar | 80 | 18 to 24 | 24 to 26 |
| Duke of Albany | 75 | 40 to 48 | 45 to 50 |
| Earliest of All, Laxton's | 50 | 20 to 24 | 24 to 28 |
| Everbearing, Bliss's | 80 | 30 to 36 | 36 to 42 |
| Evolution, Laxton's | 80 | 26 to 20 | 34 to 36 |
| Excelsior, Nott's | 52 to 56 | 10 to 12 | 12 to 14 |
| First and Best | 49 to 50 | 22 to 28 | 24 to 30 |
| Gradus, or "Prosperity" | 50 | 20 to 24 | 24 to 36 |
| Heroine | 84 | 20 to 24 | 24 to 30 |

## TABLE III.—PEAS. (*Continued.*)

| VARIETIES. | *Days From Planting to First Fair Picking.* | *Length of Vines with Ordinary Field Culture.* | *Length of Vines with Garden Culture.* |
|---|---|---|---|
| Horsford's Market Garden | 71 | 24 to 30 | 30 to 36 |
| Little Gem | 50 to 54 | 12 to 15 | 12 to 16 |
| Long Island Mammoth | 67 | 38 to 44 | 42 to 48 |
| Mammoth Melting Sugar | 80 | 42 to 48 | 48 to 54 |
| Philadelphia Extra Early | 49 to 50 | 20 to 26 | 24 to 30 |
| Premium Gem Extra Early | 59 | 12 to 15 | 12 to 16 |
| Pride of the Market | 80 | 20 to 30 | 30 to 36 |
| Profusion, Burpee's | 66 to 74 | 36 to 40 | 38 to 42 |
| Quality, Burpee's | 58 | 20 to 28 | 24 to 30 |
| Quantity, Burpee's | 64 | 24 to 30 | 30 to 32 |
| White Marrowfat | 84 | 44 to 46 | 46 to 68 |
| Shropshire Hero | 80 | 20 to 30 | 30 to 36 |
| Stratagem | 81 | 20 to 26 | 24 to 28 |
| Tall Sugar | 86 | 48 to 56 | 54 to 63 |
| Telephone | 71 | 36 to 44 | 40 to 50 |
| Yorkshire Hero | 79 | 22 to 28 | 24 to 30 |

*Unfortunately many varieties of peas bearing fancy names in our trials prove to be simply standard varieties re-named.*

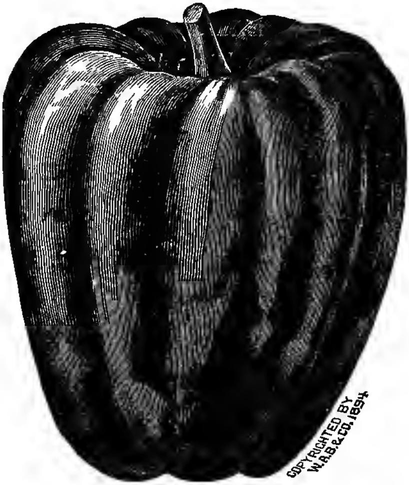
## PEPPER (*Capsicum*).

*One Ounce of Seed will Produce about Fifteen Hundred Plants.* A genus of tender annuals and biennials, indigenous to tropical South America, its original home probably being Brazil, Peru and Chili. Our garden varieties are derived from *C. annum*, *C. frutescens* and *C. grossum;* the latter, said to be a native of the East Indies, is the parent of our bell-shaped peppers; it is, however, doubtful if this species is of Asiatic origin.

CULTURE.—The plant succeeds best in a rich, warm, sandy soil. Guano or poultry manure is the best fertilizer and should be liberally applied before and after planting.

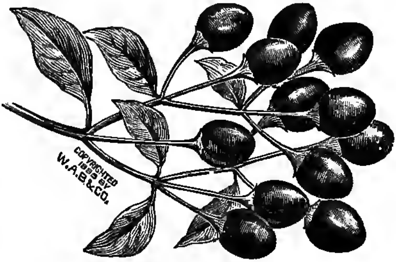
In the Northern states start in the house or under glass in March or April. Small boxes or pots such as are used for tomatoes or egg plants may be used. Fill with rich, light soil and cover with not more than a half inch of soil; give the same general care as egg plants, except that in transplanting the distance should be five inches apart each way. Transplant to the garden after the soil becomes warm and the weather settled. Set in rows two feet by eighteen inches apart.

A top dressing of hen manure in June or after the plants have attained a height of about six inches will induce rapid growth and abundant fruiting. South of Philadelphia seed of the large fruited sorts may be sown in the open ground, after danger of frost is over, but a protected situation and warm, light soil should be selected. Peppers require from one hundred and thirty-five to one hundred and sixty days from seed to maturity.



RUBY KING PEPPER. (*One-fourth Natural Size.*)

VARIETIES.—In selecting the varieties of pepper wanted for the home garden it must be borne in mind that the hot, pungent flavor is always in inverse ratio to the size. The smallest Peppers, such as Red Cluster, Coral Gem Bouquet, Bird's Eye and Tabasco are of the hottest possible flavor. Of the large, mild Peppers for stuffing, or even for slicing for salad, the best varieties are Burpee's Ruby King, Improved Bull Nose, Chinese Giant and Sweet Upright among the red varieties, while of the Yellow Peppers the Golden Dawn and Golden Queen are the largest and sweetest. "Neapolitan" Large Early is one of the most profitable to grow, as the fruits are ready for use long before any other large-fruited variety. It is very mild in flavor.



CREOLE, OR BIRD'S EYE PEPPER.

## POTATO (*Solanum tuberosum*).

*One-fourth of a Bushel of Potato Sets will Plant Three Hundred Feet of Row.* Annual. The native home of the species from which our many varieties of potatoes have originated, is believed to be the high mountain regions of South America, within those vast territories which once comprised the ancient Empire of Peru.

The early Spanish discoverers found the potato in Chili, New Granada, and all along the chain of the Andes.

Humboldt, who bestowed much study on the early history of the plant, says it was unknown to the ancient Mexicans, an opinion confirmed by concurrent testimony of many travelers and writers. It was also unknown to the aborigines in the eastern temperate regions of South America.

There is a vast amount of conflicting testimony regarding the introduction of the potato into Western Europe. It is believed to have been brought to Spain from Quito, by Spanish adventurers in the early part of the sixteenth century. From Spain the potato passed into Italy and from thence was carried into Mons by some one in attendance on the papal legate in Belgium. From Spain the tuber seems to have been introduced into the Netherlands, Lorraine, Switzerland and Germany.

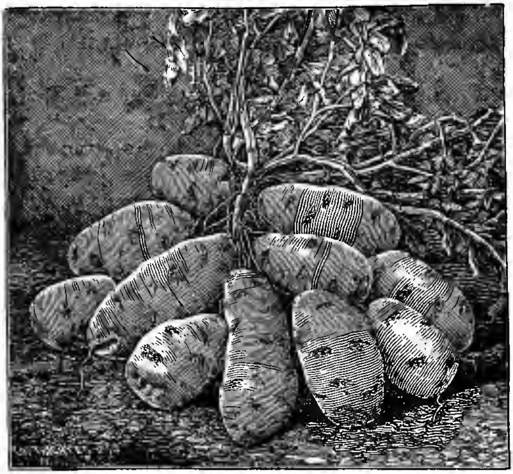
According to MM. Vilmorin-Andrieux, the potato did not become common in the central and northern districts of France until after Parmentier's labors made known its true value as a source of food supply.

The date of the introduction of the potato into the British Isles has been a subject of much discussion, but it is very generally believed that the first specimens grown in Britain were brought from Virginia by colonists sent out by Sir Walter Raleigh in 1584, who soon afterwards returned. Thomas Herriot, who accompanied Sir Walter Raleigh in several voyages, brought the first potatoes into Britain in 1586.

They were planted on Sir Walter's estate near Cork. The tubers were used for food in Ireland long before they were even known in England. In the time of James I (1566–1625), potatoes were so rare in England as to cost two shillings (sterling) a pound, and are mentioned in 1619 among the supplies provided for the royal household. Humboldt supposed that the cultivation of the tuber in Virginia, where it was known to the early colonists, must have been originally received from the Spanish colonies at the south.

Culture.—Light, rich loams, with gravelly sub-soils produce the finest potatoes. Methods of culture differ materially. On Long Island, where the Potato is one of the chief industries, two methods of planting are employed and that by the same growers. The more common practice is to "plow them in;" that is, a furrow is plowed about five inches deep, fertilizer at the rate of one ton per acre is scattered in the furrows and the seed usually cut to a single eye, dropped about six inches apart and covered with the next furrow. The same operation is repeated every third furrow.

The other plan is to plow from six to eight inches deep, according to the character of the soil; after smoothing the ground with the harrow it is furrowed out 30 inches apart, either stable manure, well rotted, or some complete fertilizer is scattered in the drills and the seed is put in and covered with the improved ridger now in general use. The owner of the land generally applies his fertilizers broadcast, and makes a second application when the potatoes are worked the second time. Then about 400 pounds per acre is spread close to the vines and worked in with the cultivator.



GREAT DIVIDE POTATO. *Showing habit of growth in the hill.* (*From a Photograph.*)

The selection of seed is one of the most important steps in growing a crop of potatoes. Medium sized tubers are invariably the best for seed. In cutting, care should be taken to divide the eyes evenly and to bruise the seed as little as possible. Mr. Van Ornam in his recent book, "Potatoes For Profit" says, "Were it always possible without too much labor I would invariably confine planting to a single eye to the hill."

For an early supply choose the hardiest and earliest varieties, which should be planted in spring as soon as the land can be made ready. Plant shallow, to avoid rot in case of cold or wet weather, in drills 30 inches apart. The distance apart in the drills depends much upon habits of growth. If small and compact in growth, like Uncle Gideon's Quick Lunch and Early Rose, from 12 to 15 inches apart will be found about right, and for Burpee's Extra Early and Beauty of Hebron 15 inches apart. For late varieties from 15 to 20 inches apart. The depth of planting should be about two inches for early and from four to five inches for late sorts. After a few days, simply waiting to let the weeds germinate and before they can get a start, go over the ground lengthwise with the rows with a light steel-toothed harrow. Keep the young plants free from weeds by continuous shallow cultivation.

For a very early crop the potatoes are sprouted before planting. Cut the seed to one or more eyes and place in a warm, light room for from four to six weeks.

Vigorous shoots will start, which, when planted in well-prepared soil in the open ground, will start to grow vigorously at once. Another method is to place the sets in a hotbed two weeks before planting out. They are then carefully lifted and set out on fresh horse manure, the heat from which induces more rapid growth.

The Colorado Potato Beetle usually appears simultaneously with the tender plants. Spray them at once with Paris green and water, made by using a tablespoonful of the poison to a pail of water. Apply with a watering-pot or broom, or knapsack sprayer if one is at hand; keep well stirred to prevent the heavy poison sinking to the bottom of the vessel.

The earliest varieties are ready to dig in from eighty to ninety days from planting, medium late in from eighty five to one hundred days, and late varieties in one hundred and twenty to one hundred and forty days from planting.

VARIETIES.—Burpee's Extra Early was first introduced by us in 1890. It has proved to be from ten days to two weeks earlier than Early Rose, Beauty of Hebron, Early Puritan, Polaris, etc., while fully one week earlier than the Early Ohio and nearly twice as productive. The potatoes are uniformly of good size, oblong in shape, very smooth, eyes set well on the surface, skin creamy white, slightly shaded with pink; the flesh is pure white, remarkably fine-grained, and of the very best table quality. The Early Rose is the standard early potato and is so well known as to need no description. Beauty of Hebron is a very rapid and vigorous grower, ripening as early as the Early Rose, which it resembles, but frequently exceeds in productiveness and excellence for table use. Burpee's Empire State was introduced by us in 1885. The potatoes are oblong in shape, of large size, and very smooth, rich and delicate in flavor, and cook evenly through without any coarseness. It yields large crops and is easily dug. Burpee's Superior was introduced by us in 1889. The tubers average quite large in size with very few small ones. Many of the large late varieties are quite hard and watery when first dug, and do not attain good cooking condition until they have become partly dry, while the Superior is in excellent condition for cooking from the time it is dug until late in the spring. It is never watery, is of very fine quality, and cooks evenly all through. The Great Divide, introduced by us in 1894, is the best potato for main crop. It was originated by the veteran potato grower, Mr. F. B. Van Ornam, from a seed-ball produced in 1887 on the Early Ohio, fertilized with the Old California. The cross was an astonishing success, and the Great Divide has proved to be the leading main crop potato for both sides of the Rocky Mountains, proving well worthy of its suggestive name. The tubers are of oblong, round form, eyes plentiful and on the surface; skin very white, firm, and tough. The flesh is clear white, and when baked or boiled breaks open like a snowball; it cooks very quickly, with a delicious nutty flavor. For recent introductions see Burpee's Annual.

## SWEET POTATO (*Ipomæa batatas*).

*Five Hundred Plants will Set from Two Hundred and Fifty to Three Hundred and Twenty-five Feet of Row; from Five Thousand to Ten Thousand Plants to the Acre.* The sweet potato belongs to the Convolvulus or Morning Glory family. It is a perennial, but is cultivated as an annual, and the common method of propagation is by means of buds or shoots from the root. The fleshy underground parts are true roots, not subterranean branches, as in the case of the white potato.

Botanical authorities are not agreed as to the native home of this plant. There are strong reasons for believing its original habitat was tropical America, but there is also undoubted evidence that the plant was cultivated in China at an early date.

A sweet potato is mentioned in Chinese writings of the second century of the Christian era.

It is said that Columbus, when he appeared for the first time before Queen Isabella, offered her various productions from the New World, sweet potatoes among others.

CULTURE.—To attain its best development the sweet potato must have a warm, sandy, well-drained soil, rich in organic matter. It will not succeed at all in compact clays or on cold, wet lands. According to Professor Milton Whitney's investigations, the sweet potato succeeds best in the truck-growing regions of the Atlantic seaboard, in soils containing not more than from six to twelve per cent. of clay.

The soil must be light, warm, and dry, and should be unshaded throughout the entire day.

It is possible to propagate by planting true seed or by planting pieces of the root, as with the white potato, but the common and only practical method of propagation is by means of shoots, sets, or plants grown on the parent roots. The sweet potato never produces seed in the United States, except in the greenhouse, and then it is of rare occurrence.

The cultural directions herein given apply only to the home garden; those interested in growing the plant as a field crop are referred to "Farmers' Bulletin," No. 26, of the United States Department of Agriculture. For the family garden the plants may be grown in the hotbed or in a box of rich, sandy soil in one of the living rooms.

The sets, shoots, or plants, as they are variously called, are obtained by sprouting the eyes or buds of the roots. In the hotbed enough manure must be used to keep the soil around the roots at a temperature of about 75° to 85° F. In New Jersey the usual depth of manure required to do this is about twelve inches, while in the Gulf States from two to five inches is sufficient. Coarse horse manure that has been but slightly heated should be used. After packing and leveling off the manure, spread over it a layer of sand or light loam from two to three inches thick; on this place the potatoes in a horizontal position, so as not to touch each other. If large potatoes are used they may be cut lengthwise and placed with the cut surface down. Cover the roots with sand or fine, light loam to a depth of from one to three inches. The roots intended to produce plants should be bedded five or six weeks before the date on which transplanting is to begin.

The earliest dates at which it is safe to set out plants are given in "Farmers' Bulletin," No. 26, United States Department of Agriculture, as follows:—

Near Jacksonville, Florida, March 20th; South Carolina, Georgia, Alabama, Mississippi, and Arkansas, April 1st to 25th, and in the southern part of New Jersey from May 1st to 15th. After noon or toward evening is the best time for transplanting to the garden, but this must not be done until the ground is warm and all danger of frost is past.

One peck of small or two pecks of medium-sized roots will furnish plants enough to plant from an eighth to a fourth of an acre, provided repeated drawings of plants are made.

A method of propagation common in the Gulf States and some other parts of the South is by means of vine cuttings.

As a rule, vine cuttings can be set out with advantage until within ninety to one hundred and five days of autumn frosts. Sweet potatoes are planted both in drills and checks. For the family garden we prefer rows three and one-half feet apart; the plants may be from 18 inches to two feet apart in the rows.

The following are approximately the amount of seed sweet potatoes required to furnish plants (not cuttings) for an acre:—

When plants are drawn repeatedly, small potatoes, one and a half to two bushels; medium-sized potatoes, two to four bushels; large potatoes, four to ten bushels. To plant an acre with plants obtained at first drawing, twice these quantities should be used. In localities where the chief dependence is on vine cuttings from early plants, much smaller amounts of seed will suffice.—From "Farmers' Bulletin," No. 26, U. S. Dept. Agriculture.

Grown in checks, the distance should be 30 by 30 inches apart.

In the truck-farming regious with sandy soil the practice is to plow very shallow,—three or four inches deep; heavy and less permeable soils are plowed deeper. A low ridge on well-drained land gives larger yields. High ridges are warmer and of some advantage in heavier soils, but the crop is more liable to suffer from drought. Give shallow cultivation without throwing dirt on the vines and keep the surface soil loose and free from weeds. In the more northern regions where the sweet potato is grown, it is best to prevent the vines taking root at the joints, at least so long as they can be cultivated.

Sweet potatoes should be dug only when the ground is dry and before severe frost occurs.

A rule sometimes given for determining ripeness is this:—Break several potatoes and expose the pieces to the air for some time. If sufficiently mature to keep well the original color is maintained; if unripe the broken surfaces assume a dark or greenish appearance.

Dig in the forenoon, and after several hours' exposure gather the potatoes in baskets or boxes, holding about a bushel each. Before digging the vines are cut and drawn from the row with a sharp hoe; the forked hand-hoe, or the plow is used to dig the roots.

Small quantities may be kept for a few months by packing in dry sand and placing in a dry cellar or room. In the South sweet potatoes stored several days after digging, in large baskets or boxes lined and covered with several thicknesses of newspaper, have been found to keep fairly well for a short time. In experiments at the South Carolina Experiment Station, cotton-seed hulls as a packing material have proved superior to cotton-seed, so often used for this purpose. Dry sand was found useful as a covering.

Ninety days after transplanting is generally regarded as the shortest period in which the early varieties are ready to be dug, but under some very favorable conditions of growth from sixty to seventy-five days are reported.

VARIETIES.—Southern consumers prefer the more sugary varieties, like Sugar Yam, Spanish Yam, Georgia Yam, Vineless and Pumpkin Yam. In the North the more flowery or starchy sorts are demanded, like the Yellow Nansemond, Red Nansemond, and Jersey. Among the early varieties we mention Southern Queen, Vineless, Early Carolina, and Strasburg.

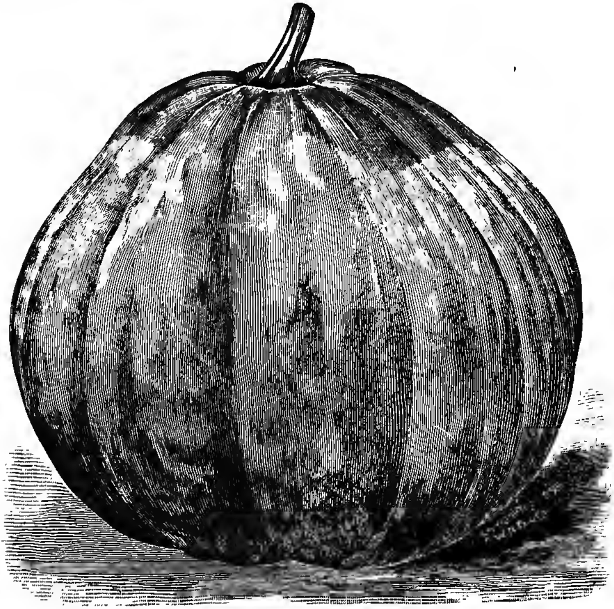
## PUMPKIN (*Cucurbita pepo*).

*One Pound of Seed will Plant from Two Hundred to Three Hundred Hills.* An annual, native to the southwestern regions of the U. S. and Mexico.

Notwithstanding its disputed origin, there is strong evidence that the pumpkin is indigenous to the south temperate regions of North America. The pumpkins cultivated by the Romans and mentioned in the writings of the Middle Ages belonged to another species, DeCandolle thinks to *C. maxima*, but this is also in doubt since the seed of this species is asserted by Wittmack to have been discovered in the Peruvian tombs of Ancon. These ancient tombs were used by the natives as places of sepulture long after the arrival of the Spaniards, so that the seeds may have been brought to Peru by the Spanish Conquerors along with others of common European cultivation. Sir Joseph Hooker mentions the species as having been found wild on the banks of the Niger in Guinea.

CULTURE.—This is not a suitable crop for the home garden, unless there is ample room, as the vines are most vigorous in growth and quickly spread over a large area.

The common practice, and a good one, is to plant in the corn field in hills about eight or ten feet apart. Drop a half dozen seeds edgewise with the eye down, to a hill, and cover to a depth of one and a half inches; thin out to three thrifty plants to a hill. They demand the same general culture as melons and squashes. Pumpkins require from one hundred and five to one hundred and twenty days from seed to maturity.



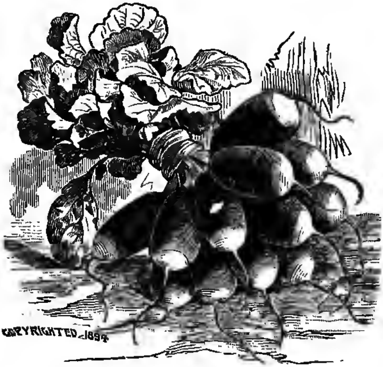
Burpee's Quaker Pie Pumpkin.

Varieties.—We mention among those catalogued in "Burpee's Seed Annual" the following: Burpee's Quaker Pie, Japanese, Genuine Mammoth or True Potiron, Small Sugar, "Big Tom," Small Sugar, White Cushaw, Burpee's Golden Oblong and Green-Striped Cushaw.

## RADISH (*Raphanus sativus*).

*One Ounce of Seed will Sow One Hundred Feet of Drill.* An annual that has been under cultivation from the earliest historic times. The common ancestor of our modern species probably had its original home in the temperate regions of Southwestern Asia. But this is uncertain. Some authorities accredit it to China, and others think it had a wide aboriginal distribution in *R. raphanistrum*, common in the temperate regions of Europe and Asia. The radish is mentioned in Chinese books written more than three thousand years ago. Herodotus says that according to an inscription it was eaten by the builders of the great Pyramid of Cheops.

The plant did not find a place in English gardens until near the middle of the sixteenth century (1548).



New Bright Breakfast Radish.

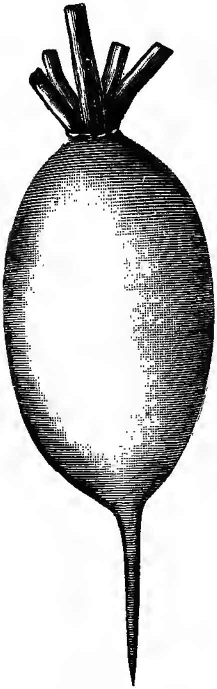
Culture.—Its cultivation is simple. Light, sandy soil, made very rich and mellow with thoroughly rotted manure, is essential to produce crisp, tender radishes.

Rank manure not only produces rot and a sharp, pungent flavor, but induces a coarse woody growth. If the soil is of a heavy character it must be made quite fine to insure rapid growth and well formed roots. The seed is almost invariably sown too thick. The fact is the seed should be sown at least half an inch apart,—one inch apart would be better, so that each plant would have a clear open space to grow without being crowded. The seeds should be sown in drills six inches apart and covered with not more than half an inch of fine, sifted soil. Sowings for a succession should be made at intervals of about ten days.

Good radishes can not be grown in dry, hot soil, consequently if a supply is desired at mid-summer the bed must be partially protected from the sun. This may be done in the same manner as has been advised for growing a summer crop of lettuce. For an extra early supply sow in hotbeds in February. The soil should be light, very rich and have a constant, gentle heat.

For winter radishes, seed may be sown early in the fall, in drills one foot apart. When the season is favorable they are particularly desirable, but extreme dry and hot weather in the early fall makes them so woody in character, as to be worthless. Under favorable conditions they are tender, crisp and delicious. In deep, rich soil the long varieties are most satisfactory, but either these or the turnip-rooted sorts must be grown quickly to be good.

The wavy-striped Flea-Beetle is at times very destructive to the leaves. Tobacco dust, lime or unleached wood ashes scattered over the leaves as soon as they appear above ground is an effectual remedy. Earliest varieties are ready for the table in from eighteen to twenty-two days from planting; later sorts from twenty-five to forty-five days.



Earliest White Radish.

Varieties.—The New Earliest White, Forcing Radish is undoubtedly the earliest White Radish in cultivation; in fact at Fordhook it was the earliest of all Radishes—being ready for the table in from eighteen to twenty days from sowing the seed. It is a handsome olive-shaped radish with both skin and flesh a pure, clear white; flavor mild, crisp and tender. Burpee's Earliest (Scarlet Button) Radish is a beautiful, round radish with deep scarlet skin, the flavor is very mild, and for tenderness, crispness and earliness it surpasses all other strains of Scarlet Turnip Radish; it is ready for the table in from eighteen to twenty days from seed. New Bright Breakfast, Golden Dresden, Early Round Dark Red, Long White Vienna and many other desirable varieties are described in "Burpee's Seed Annual."

Summer varieties are Large White Globe, White Strasburg and Burpee's Surprise. The best winter varieties are Chinese Rose Winter, California Mammoth White, and White Chinese or New Celestial.

## RHUBARB (*Rheum rhaponticum*).

*One Ounce of Seed will Sow One Hundred and Twenty-five Feet of Drill.* Some species of this genus have been cultivated from the earliest times.

The so-called Turkish Rhubarb used in medicine is the root of *R. palmatum*, a native of China. The rhubarb of our gardens is a hybrid of *R. rhaponticum* and *R. hybridum*, natives of Mongolia and the temperate regions of Western Asia. The plant was introduced into England in 1778. It should have a place in every family garden.

CULTURE.—Rhubarb may be grown in most any well-drained soil, provided it be rich and made friable by deep culture. Rich, deep, but rather light loam yields the finest product. If this is not to be had in the home garden, trench to a depth of at least two feet any well-drained bed and fill in with hotbed compost mixed with loam and sand, which should be well stirred together. The deeper the soil is stirred the quicker and more thrifty will be the growth.

As soon as garden operations can be begun in spring, sow the seed in drills two feet apart and about one inch deep; thin out the plants to six inches apart in the rows.

In the latitude of Philadelphia, and throughout the more northern states, the practice is to sow the seed in cold frames from February to the beginning of April, in deep, rich composted soil. Sow in drills one foot apart, cover with one-fourth of an inch of finely sifted composted soil, which should be firmed well down upon the seed. Keep the seed bed moist, but not wet. Thin out the young plants to six inches apart in the rows, and in about six weeks they will be ready to transplant to the open ground. Set out in rows 12 inches apart each way, and give clean cultivation through the summer. In the fall or following spring transplant to permanent beds, setting the plants in rows three by four feet apart.

For the first year the ground between the permanent rows may be used for a crop of lettuce, beans, or any low growing vegetables, but after the second year the leaves will cover the ground and require it for their full development. Keep the ground clear from weeds and break off the flower stalks as they appear, in order that the plants may not exhaust themselves by forming seed. Every autumn give the rows a liberal covering of coarse manure, which should be carefully worked in the next spring so as not to cut or injure the roots. The stocks should not be cut before the third year. Myatt's Victoria is a suitable variety for the home garden.

## SALSIFY (*Tragopogon porrifolius*).

*One Ounce of Seed to One Hundred Feet of Drill.* A biennial found wild in Greece, Dalmatia, Italy and Algeria. This plant has come under cultivation at a comparatively recent date. It was introduced into France in the sixteenth century, but only during the last century has salsify been cultivated in American gardens.

CULTURE.—It succeeds best in a light, deep soil which has been heavily manured for a previous crop. Fresh manure should not be used under any circumstances, as it produces coarse, forked roots. If the ground is not quite rich enough work into it some old compost or very finely rotted manure. The soil should be worked to a depth of fifteen to twenty inches and as soon as operations can be begun in the spring. Then sow the seed at once in drills one foot apart, and cover with one inch of soil. When the plants are three inches high thin out to six inches apart. Give frequent shallow cultivation.

SANDWICH ISLAND MAMMOTH SALSIFY.

The roots may be taken up late in autumn and stored in moist sand in a cold room; or they will not be injured if left in the ground and dug when wanted during winter. After growth begins in spring the roots are unfit for use. Salsify requires from one hundred and thirty to one hundred and forty days to complete its growth.

VARIETIES.—The Sandwich Island Mammoth is of larger size than the Long White, and is equally as fine for the table.

Salsify is a delicious and nutritious vegetable worthy of more general cultivation for use in winter when the supply of really good vegetables is limited.

## SORREL (*Rumex scutatus*).

*One Ounce of Seed will Sow One Hundred and Fifty Feet of Drill.* A hardy perennial, native of temperate Europe, northern Asia, and the mountains of India. The plant is extensively grown in France and Italy. There are two species cultivated by the French gardeners, but *R. scutatus* is the more generally grown because of its more agreeable flavor when boiled and served like spinach.

CULTURE.—Seed should be sown early in the spring, in drills eighteen inches apart, and covered with one-half inch of soil. When the plants are three inches high thin out to one foot apart in the rows. Being a perennial the roots may remain undisturbed for several years, when they may be divided and planted out the same as rhubarb. Sorrel should have a sheltered situation, as the hot sun has a tendency to increase the acidity, and also to decrease the size of the leaves, which are used in the same manner as spinach.

BROAD-LEAVED FRENCH SORREL.

From its pleasant acid flavor, sorrel materially improves spinach, if the two are used together in equal quantities. The leaves may be used as soon as the plant has made a growth of several inches. The Broad-leaved French is the most popular variety in America, and so highly is it esteemed in France that large fields of it are cultivated in the vicinity of Paris.

## SPINACH (*Spinacea oleracea*).

*One-half an Ounce of Seed to One Hundred Feet of Drill.* A hardy annual, supposed to be a native of Western Asia. DeCandolle thinks it came from the empire of the ancient Medes and Persians. It was commonly cultivated in England early in the sixteenth century.

It is hardy, easily grown in rich soil, and is consequently an important vegetable for cold and temperate climates.

CULTURE.—Spinach is one of the few vegetables that can be raised to advantage the latter part of the year, and, as there are always vacant places in the garden at this season, the gardener has every opportunity to make the most of the place, and at the same time secure a vegetable both in autumn and very early spring.

It is a good plan to have the ground in readiness so that several beds can be sown in succession, at intervals of a week from the first to the end of September. The most forward of these, if covered up with straw at the approach of cold weather will furnish a wholesome vegetable for the table when others are scarce, and the later sowings will withstand the winter with a slight protection of leaves, straw or other litter.

SPRING SOWING.—Sow the seed in drills one foot apart and one inch deep as soon as the ground can be prepared in the spring. Begin to thin out for table use when the plants are about an inch in diameter.

It will quickly run to seed unless the ground is kept wet and made very rich ; this is best effected by the use of horse manure which has not become overheated. Spinach may be used in from twenty-one to thirty days from sowing the seed.

VARIETIES.—The Victoria is a new variety from Germany. The foliage is heavy, with broad, dark-green leaves of the true Savoy appearance and of the finest quality. What makes it of special value for spring planting, both for the family garden and market, is the fact that it is in prime condition for two to three weeks after all other varieties of spinach have run to seed. Long Standing or Enkhuizen is one of the best for spring sowing.

VICTORIA SPINACH. (*From a Photograph.*)

The leaves are large, thick, fleshy, and crumpled, fully equal in quality to the well-known Savoy-leaved. The Long Standing Prickly matures a little later than the round-leaved sorts, but furnishes a large quantity of very thick leaves of excellent flavor. Norfolk Savoy-leaved or Bloomsdale has curled wrinkled leaves like Savoy Cabbage ; very hardy.

## NEW ZEALAND SPINACH (*Tetragona expansa*).

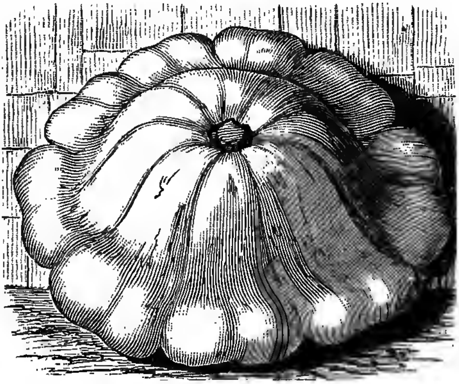
*One Dozen Plants will Afford an Abundance for a Large Family.* An annual, first found growing wild on the shores of New Zealand in 1712, by Sir Joseph Banks, who accompanied Captain Cook's expedition. The plant has been found since growing wild on the seacoast of Tasmania, South and West Australia, and in Japan and South America. It bears no relation botanically to the common spinach, but is a good substitute for it, especially during the dry, hot weather of summer.

CULTURE.—New Zealand Spinach is a rank grower, and a half dozen plants are sufficient to supply a family of moderate size. The seed has a hard outer covering, and for this reason should be soaked in hot water over night before planting.

Plant the seed in hills four feet apart each way and one inch deep as soon as active garden work begins in the spring. Thin out to one thrifty plant to a hill. In six weeks from sowing leaves will be fit for gathering, and can be taken off the entire summer. The plant is of branching habit, which may be encouraged by occasionally nipping off the ends of the stems.

## SQUASH (*Cucurbita*).

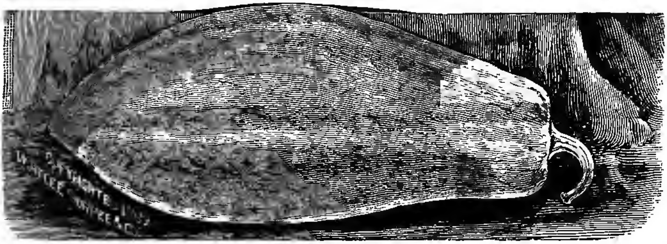
*Summer Varieties, One Ounce of Seed to Twenty-five Hills; Winter Squashes, Two Ounces of Seed to Twenty-five Hills.* In the whole range of vegetables there is not a class so variable in character and habit as the squash, and its nomenclature is as strangely mixed. A given variety is called squash in one place and pumpkin in another; while in another country the common name of gourd is applied to all. There is a wide difference in the edible qualities of many of the varieties or species, as the case may be. The bush squashes are only edible when green, or in a half ripe state, while some of the running sorts are only in perfection when fully ripe. The bush or summer squash can only be eaten during a few days of its growth, while a Hubbard is edible for many months if kept in a dry, warm room.



MAMMOTH WHITE BUSH SQUASH.

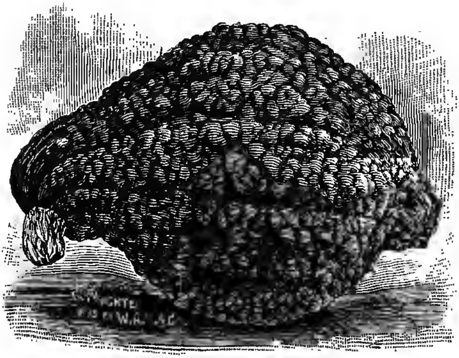
All the sorts are supposed to have had their origin in South America, but the first settlers of our country found them among the Indians as far north as Canada. Our best winter squashes are from seed brought by the early navigators from Peru.

CULTURE.—A warm, rather light alluvial soil is the best for squashes; but whatever the character of the garden soil let the ground be well enriched with stable manure, which it is best to broadcast and spade or plow in. Make the earth fine and friable by deep working, and plant summer varieties in slightly elevated hills, four feet apart each way, at the same time cucumber and melon seeds are sown. The seeds of both summer and winter squashes germinate most surely and quickly when placed in a vertical position with the eye down. Planting must not begin until all danger of frost is past, and the soil is comparatively warm. Under each hill place a shovelful of rich compost or rotted manure, and set from six to eight seeds several inches apart in the hill. Cover early varieties with one inch of soil and press firmly on the seed.



FORDHOOK SQUASH.

The usual practice is to plant the late sorts in hills six to eight feet apart each way, leaving four plants to a hill. A better plan is to plant in rows from 12 to 20 feet apart, and to cut out the vines to six feet apart in the rows. Between the rows an early crop of beans, peas, cabbage, or any crop that can be taken off during July, may be grown. Seed should be planted in June, one and a half inches deep, and the young plants kept well cultivated until the vines begin to run rapidly; then if the cultivator has been the implement employed it should be discarded and the hoe only used, and with caution, that the widely spreading roots be not injured. Give very shallow hoeings, and clear the ground as quickly as possible from all intermediate crops. Under no circumstances use home-grown



CHICAGO WARTED HUBBARD SQUASH.

seed; cross-fertilization is sure to take place in the small garden, if cucumbers or other cucurbits are present. From such seed a worthless product will be the result. Summer squashes are ready for the table in from fifty-five to sixty-five days, and winter sorts in from one hundred and fifteen to one hundred and twenty-five days from planting.

SUMMER VARIETIES.—The Early White Bush Scalloped is the well known Patty-pan Squash. It is of a light cream color, productive, and the earliest to mature. The Early Yellow Bush, Scalloped, is similar to the preceding, but of a deep orange color. The New Mammoth White Bush, Scalloped, or Improved Patty-pan, is of a beautiful white color, ready for use quite early and of large size. Cocozelle Bush, and New Giant Summer Crookneck, are desirable varieties described in "Burpee's Seed Annual."

FALL AND WINTER VARIETIES.—The Boston Marrow is a popular fall squash, with thin, bright-orange skin; flesh also of orange color, tender and rich flavor. The Hubbard is the standard winter sort. The flesh is dry, fine grained; excellent for table use and a good keeper. Pike's Peak is a most excellent winter squash, maturing about the same time as the Hubbard. The flesh is solid, thick, and of rich golden-orange color; it is a good keeper. Fordhook is bright cream outside and straw yellow within. The flesh is dry and sweet—the best in quality of all winter squashes. Kept in a cool, dry room, it remains in perfect condition throughout the winter and spring and until late in June, when summer squashes are ready.

## TOMATO (*Lycopersicum esculentum*).

*One Ounce of Seed will Produce about Four Thousand Five Hundred Plants.* An annual, indigenous to tropical America, thought by De Candolle to have been first cultivated by the ancient Peruvians. Humboldt, who gave the subject much study, believed the cultivation of tomatoes to have been of early date in Mexico. It was first grown in Spain early in the sixteenth century, then in Italy, and soon afterward in France, but was not introduced into England until 1596.

Only in the last century, and that the latter half, has the tomato come under universal cultivation in the United States. Its importance both in the vegetable garden and as a field crop for commercial purposes is so great that the gardener's skill has been taxed to the utmost in the production of new varieties with a view to improvement. In the whole list of garden vegetables there is none so susceptible to treatment; none more liberally rewards attention, nor so quickly resents neglect, in quantity and quality of fruit.

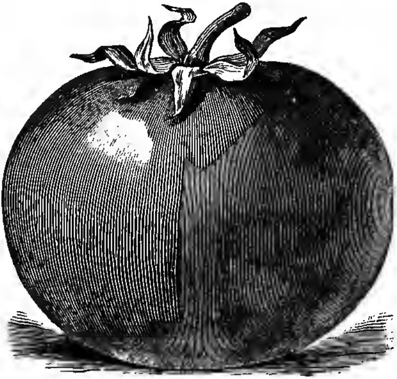
**Culture.**—A light, rich loam produces the finest tomatoes, but for earliness moderately rich, sandy soil should be selected. Sow seed in the hotbed or in shallow boxes, which may be placed in the sunny window of a living room about six weeks before time for planting in the open garden. The seed should be sown in drills six inches apart and covered with a half inch of fine soil. In the latitude of Philadelphia this is done about the beginning of March. When the second pair of leaves appear transplant to small boxes three inches apart each way or to small thumb-pots. When about three inches high a second transplanting should be made to larger pots in order that the plants may not become root-bound. The seedlings should have plenty of sunlight and fresh air whenever the weather will permit. Transfer to the open ground after danger of frost is past, planting from three to four feet apart each way. A later planting may be made by sowing seed in a cold frame from the beginning to the middle of April, and transplanting to the garden about the first of June.

For a late crop drop a few seeds at each hill of early sweet corn, and as soon as the corn is used cut the stalks; leave but one sturdy plant to a hill; or, for a very late crop in localities where there is no frost before the first of November, tomatoes can be grown by making hills five feet apart each way, and dropping a few seeds in the hills early in June. The first picking from these plants will be the latter part of September, and they will be in full bearing two weeks later. At the approach of frost the plants will be loaded with full-sized fruit, just beginning to put on the whitish tinge,—the first indication of ripening. In a warm situation, with northern protection, plow a furrow or dig a trench wide and long enough to contain the plants, which should be cut quite close to the ground. Spread out the plants

FORDHOOK FIRST TOMATO. (*From a Photograph.*)

with their green fruit in the trench until about two feet thick, and over them place a covering of straw six inches in depth, which hold in place by the use of some light brush. The warmth from the earth will ripen the larger fruit perfectly. Early varieties mature in from ninety to one hundred days from seed; the later ones in from one hundred and twenty-five to one hundred and fifty days.

VARIETIES.—Among the many varieties the following are suggested for the family garden: Fordhook First is a perfectly smooth, solid tomato of first-class appearance and extremely early. Livingston's Beauty is a bright pink, remarkably solid-fruited variety, bearing smooth, perfectly shaped tomatoes with no green core. The Stone is of a handsome, uniform, deep red color, with large, smooth, and solid fruits. The Matchless is of a very rich cardinal red color and is decidedly the best bright red tomato in cultivation to-day. The fruits are of the largest size, and the size is maintained throughout the season. Had we to confine ourselves to one variety it would be the Matchless. The New Imperial is a fine, large, early tomato, while the Truckers' Favorite is the best of all the purple colored tomatoes. To eat as sliced raw tomatoes, few can equal in flavor The Turner Hybrid or Mikado. The Golden Queen is decidedly the best of all yellow tomatoes.



TRUCKERS' FAVORITE TOMATO.

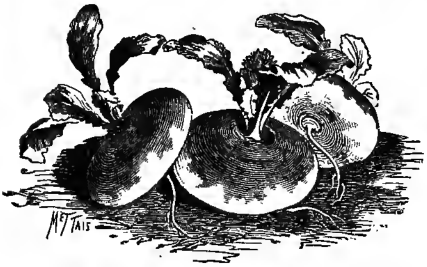
Among small-fruited varieties are Red Pear-shaped, Yellow Plum-shaped, Red and Yellow Cherry, all of which are useful only for preserving.

## TURNIP (*Brassica rapa*).

*One Ounce of Seed will Sow Two Hundred Feet of Drill.* A hardy biennial, native to temperate Europe, from whence at an early date it was diffused throughout Western Asia. The turnip was cultivated as a vegetable by the Greeks 2300 years ago, and in Western Europe before the Christian era, but we have no accounts of its having been grown extensively as a field crop before 1600. Gerarde in his "Herbal" (1597) speaks of the turnip as a garden vegetable only. The white varieties have long been known in Great Britain as *Dutch Turnips;* the name probably arose from the fact that the English markets were for a long time supplied with turnips by the gardeners of Holland.

The Swedish Turnip, which attains a much larger size, has its parentage in *B. campestris,* a slender-rooted form which probably had an aboriginal range from the Scandinavian peninsula to Siberia. It is of more recent introduction and believed to be a native of Sweden. Its varieties are known as Swedes, Ruta Bagas, Swedish, and Russian Turnips.

CULTURE.—The soil best adapted to the turnip is a sandy or gravelly loam. It succeeds best, like kindred plants of the genus Brassica, in cool, moist climates near the sea.



EXTRA EARLY PURPLE-TOP MILAN TURNIP.

For an early supply sow the seed as soon as the ground can be prepared, in finely worked, rich soil. Sow in rows one foot apart and half an inch deep; thin out the plants to three inches apart. In a favorable season the turnips will be ready for use by the middle of June. For a succession sow every two weeks until the last of July, and for a late crop until the end of August. The crop matures in sixty days from seed.

VARIETIES.—Early Red or Purple-Top Strap-Leaved is a quick grower, flesh fine-grained and sweet flavored. Extra Early Purple-Top Milan is the earliest turnip in cultivation. The bulbs are flat, medium size, quite smooth, with a bright-purple top. White Egg is a rapid grower, egg-shaped, with thin, white skin; flesh solid, fine-grained, and of sweet, mild flavor. Red Top White Globe is also one of the best early varieties grown; bulbs globe-shaped with red or purple top; a rapid grower and keeps well. Petrowski is most distinct variety of early maturity. The roots are flat and entirely free from rootlets. It is a desirable variety for autumn sowing. Other varieties described in "Burpee's Seed Annual" are Robertson's Golden Ball or Orange Jelly, Yellow Aberdeen, Early White Flat Dutch, Sweet German, or Long White French, Long White, or Cowhorn, Pomeranian White Globe, and the New Scarlet Kashmyr Turnip. The latter is a most distinct novelty, bearing a striking resemblance to a large radish. It is of a deep, rich crimson color above, shading to a soft crimson-rose below; it is a turnip of excellent flavor and high cooking qualities.

## Ruta Bagas, or Swedes.

The seed of Ruta Bagas should be sown from the latter part of June until the middle of August. In the home garden they can follow early potatoes, peas, or be planted wherever there is a vacant place. The rows should be 15 inches apart, and seed sown a half an inch deep; thin out the plants to six inches apart in the rows. In field culture the rows should be from 18 inches to two feet apart to admit of horse cultivation.

To have turnips in a fresh, crisp condition during winter, harvest them before hard frosts, and keep in a cold cellar or pit in dry sand or loam. Those interested in growing roots for feeding purposes are referred to our little book, "Root Crops for Stock Feeding, and How to Grow Them."

VARIETIES.—The Monarch, or New Elephant, is a very popular variety in England. It produces large, oval-shaped roots, with short, small necks and relatively small tops; the skin is dark red above ground and yellow below; flesh, rich yellow, fine-grained, and of the best quality. Owing to the fact that the roots grow so much above ground, it is an easy matter to harvest them. Burpee's Improved Purple-Top Yellow is among the hardiest and most productive varieties in cultivation. It is a large, purple-top, yellow Swede, slightly oblong in shape, with single tap-root; it is free from coarseness of neck, keeps well until late in the spring, and the flesh is sweet and rich.

MONARCH RUTA BAGA.

## SWEET AND MEDICINAL HERBS.

A few pot and sweet herbs are indispensable to every well-managed garden. The labor which their simple culture involves is trifling, while they furnish wholesome and appetizing seasoning for soups, meats, etc., the year round.

They should be cut on a clear day just before coming into full bloom and dried quickly in the shade. When properly cured pack them away in tin boxes or bottles, so as to exclude the air. In addition to those grown for their agreeable, aromatic flavors, we include several quite useful in domestic medicine.

Culture.—General cultural directions for those which follow are about the same. A mellow, sandy soil thoroughly prepared and kept well cultivated is the best. Sow the seed early in spring in shallow drills 12 inches apart; cover to a depth of twice the thickness of the seed with finely sifted soil, which should be well firmed down on the seed bed. When the plants are well up thin out or transplant far enough apart to permit each plant to have plenty of air and sunshine.

**Anise** (*Pimpinella anisum*).—An annual, native of Asia Minor, Greece, and Egypt. Prefers a warm, well-drained soil; grows rapidly and requires little or no care. Thin out the plants to stand four inches apart. Used in cordials for garnishing and flavoring; also for dyspepsia and colic.

**Balm** (*Melissa officinalis*).—A perennial, native to the South of Europe. The leaves have a fragrant, lemon-like odor, and are used for making balm wine and balm tea, which are thought to have some value in low fevers. Thin out the plants to from eight to twelve inches apart. Also readily propagated by cuttings or division of the roots in fall or spring.

**Basil** (*Ocymum basilicum*).—A native of India, of annual duration. Being tender, this plant is best started in the house in a small box or pot of light, rich soil, covered with a pane of glass. Transplant to the garden after the weather becomes warm and settled. Set the plants eight inches apart each way. The leaves have an aromatic flavor resembling cloves. When just coming into bloom cut back to within two or three inches of the ground and dry the branches in the shade. To have the green leaves through the winter, a plant may be transferred to a box or pot and be kept in a sunny window.

**Bene** (*Sesamum orientale*).—A tender annual, native of the East Indies. The leaves when immersed in water give out a mucilaginous substance which is beneficial in the treatment of dysentery. In Japan and parts of Africa the oil obtained from the seeds is used like lard in cookery. The plant is too tender for the Northern United States unless started under glass.

**Borage** (*Borago officinalis*).—A hardy annual, native to the shores of the Mediterranean in Europe and North Africa. It succeeds well in any garden soil, and if started under glass and transplanted to the garden, will bloom all summer. The flowers are a pretty true blue, and afford excellent food for bees throughout a long season. The leaves are used as a pot-herb. Sow at the same time as other herb seeds and thin out the plants to eight inches apart.

**Caraway** (*Carum carui*).—A biennial, common through the South of Europe, and probably a native of Western Asia. It has been in use from ancient times for flavoring bread, pastry, cheese, sauces, etc. The leaves and young shoots are also sometimes eaten. Sow the seed where the plants are to grow in drills two feet apart and thin out to eight inches apart in the rows. If the seed is sown in July or August a crop will be produced the following summer.

**Catnip, or Cat Mint** (*Nepeta cataria*).—A hardy perennial, native of Europe, but naturalized in North America and found growing wild throughout most States of the Union. Easily grown from seed sown in spring or fall. The leaves and young shoots are sometimes used for seasoning; also used as a mild nervine for infants. Two or three plants, two feet apart, will be sufficient. Pull the plants up by the roots when in flower and dry in the shade.

**Coriander** (*Coriander sativum*).—A hardy annual, native of Southern Europe. The seeds have a strong, aromatic flavor and are used in confectionery and in the manufacture of liqueurs.

**Dill** (*Anethum graveolens*).—Cultivated as an annual, though of biennial growth in its native habitat, which is Southern Europe. Sow early in spring and keep clear of weeds. The seeds have an aromatic odor and warm, pungent taste. They are used as a condiment and in making pickles.

**Fennel, Sweet** (*Fœniculum officinale*).—A hardy perennial, indigenous to Southern Europe. The leaves are used in fish sauces and the seeds enter into the composition of liqueurs.

**Horehound** (*Marrubium vulgare*).—A hardy perennial, native of Europe, but naturalized in the United States. An infusion of the leaves is used as a tonic. It is also used in confectionery and in domestic medicine as a popular cough remedy.

Propagated by division of the roots or from seed sown in the fall or early spring.

**Hop** (*Humulus lupulus*).—*One or two packets of fresh seed will usually supply sufficient plants for the home garden.* A perennial whose original habitat is unknown, but the plant is found growing wild in Europe, from Sweden to the mountains of the Mediterranean region, in Asia Minor, and Eastern Siberia. It is also said to be indigenous to the Eastern United States.

In Continental Europe the tender shoots are pinched off in the spring and used as a vegetable. In Belgium the young shoots are prepared for the table in much the same manner as asparagus and salsify.

CULTURE.—The seed germinates slowly, and as its vitality is soon lost should never be used when over one year old. Sow in a box of rich, sandy loam, and cover the seed with two or three times its own thickness of finely sifted soil. Keep moist until the plants appear. By far the most satisfactory method of increase is by transplanting pieces of root or by propagating cuttings which should have one healthy eye below and one above the surface. Give the vines stout, long poles or a trellis, and in the fall spread a heavy dressing of manure about the roots. In the Northern and Middle States the crop should be gathered during August.

**Hyssop** (*Hyssopus officinalis*).—A hardy perennial, native to Southern Europe or Siberia and naturalized in the United States. The flowers of the plant are used in domestic medicine as a stimulant and expectorant, but are not very greatly esteemed by the medical profession. May be raised from seed planted in the spring or by division of the root. Plants should be twelve inches apart each way.

**Lavender** (*Lavendula vera*).—A medicinal herb of perennial duration, indigenous to Southern Europe. This plant is chiefly grown for its flowers, which are very fragrant and much used for perfuming linen ; they are also the source of the essential oil of lavender and the well-known lavender water. For domestic use pick the flowers before they begin to fade and dry quickly in the shade.

The plant succeeds best in a light, rich soil of calcareous nature.

As germination is slow and the vitality of the seed uncertain, it is best to sow several packets of seed ; this should be sown in spring where the plants are to grow. Propagation is also effected by division of the roots or by cuttings. Lavender is a lime-feeding plant ; a light dusting of air-slacked lime or wood ashes about the rows in spring will induce a sturdier and more vigorous growth.

Every third or fourth year set out new cuttings or sow fresh seed.

**Marjoram, Sweet** (*Origanum marjorana*).—A half hardy herbaceous plant, native of the East, but grown in our gardens as an annual. The leaves and ends of the shoots, both in the green and dried state, are highly esteemed for seasoning. Sow in the spring as directed in the general cultural directions for these plants and thin out to eight inches apart in the rows.

**Pennyroyal** (*Mentha pulegium*).—A perennial, native of Great Britain and Continental Europe. Used for medicinal purposes. The essential oil of pennyroyal is much used for the protection it affords from noxious insects, especially mosquitoes.

Succeeds best on moist, heavy soils. Propagated from seed, but more readily by division. The wild pennyroyal of our woods is a native species of annual duration. Sow seed in autumn or spring.

**Rosemary** (*Rosmarinus officinalis*).—A hardy perennial, native to the southern coasts of Europe. The leaves are used for seasoning, and the flowers, which are pale blue, yield under distillation a volatile oil much used in perfumery. Readily raised from seed sown early in the spring.

**Rue** (*Ruta graveolens*).—A hardy perennial, native of Southern Europe and Eastern Asia. The leaves have a strong odor and disagreeable, acrid taste. Rue is mentioned in old cook-books as being used for seasoning food, but many of those who try it for this purpose will probably feel some degree of contempt for the culinary tastes of our forefathers. Rue is used in medicine as an antispasmodic and stimulant. It is also good for poultry.

**Sage** (*Salvia officinalis*).—A hardy perennial, native to Southern Europe. Succeeds best on well drained, rather dry soil of calcareous nature. Easily grown from seed or cuttings. In gardens it is generally grown as a border plant. Sow the seed thinly, early in the spring, in drills twelve inches apart, and thin out the young plants to stand eight inches from each other. Cut when coming into flower and dry quickly in the shade.

**Holt's Mammoth Sage.**—After having grown and thoroughly tested this valuable variety for a number of years, we can recommend it most highly. The plants are very strong-growing, the first season attaining one foot in height, and spreading so that a single plant covers a circular space three feet in diameter. The leaves are borne well above the soil, keeping them clean ; they are very large and of unusual substance, strong in flavor, and of superior quality. A single plant will yield more than a dozen plants of the common sort. It is perfectly hardy, even in New England ; it never runs to seed.

**Savory, Summer** (*Satureia hortensis*).—A hardy annual, native of

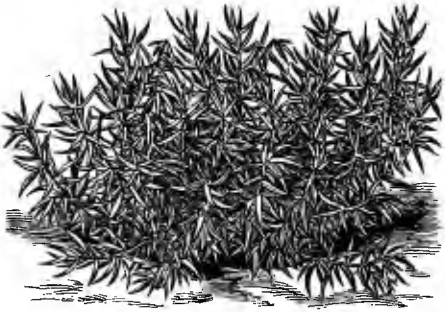
Southern Europe, and naturalized in many parts of the United States. Sow a packet or two early in the spring, in light, rich soil. The leaves and flowers are used for flavoring soups and dressings.

**Winter Savory** (*Satureia montana*).—This is a hardy perennial indigenous to Southern Europe. Culture, same as for Summer Savory.

**Tansy** (*Tanacetum vulgare*).—A hardy perennial of European origin, but common as a wayside weed in the United States. Will grow anywhere The leaves are used as a tonic in domestic medicine.

**Tagetes Lucida** or *Sweet Scented Mexican Marigold.*—A very pretty plant used as a substitute for the true Tarragon.

**Tarragon** (*Artemisia Dracunculus*).—A perennial, native of Siberia or Southern Europe. The flowers are whitish, very small, and almost always barren. The plant is propagated by division of the tufts or from root cuttings. Tarragon possesses a very delicate aromatic flavor which makes it highly appreciated for seasoning salads or for making Tarragon vinegar. It succeeds best in a rather warm, dry situation. In the Northern States give some protection during winter. The foliage should be cut and cured in the same manner as other herbs.



THE TRUE TARRAGON. (*From a Photograph.*)

**Thyme** (*Thymus vulgaris*).—A perennial indigenous to Southern Europe. Sow the seed thickly as soon as the ground gets warm in spring and transplant one foot apart each way in July. Thyme succeeds best in well drained, warm garden soil. The plant may also be propagated by division of the roots or from cuttings.

**Wormwood** (*Artemisia absinthium*).—A perennial of European origin which was formerly used largely as a vermifuge but is now employed chiefly in the fabrication of various liqueurs. It is said to be beneficial to fowls. Easily propagated by division, or from seed.

# APPENDIX.

## USEFUL PLANTING TABLES.

### QUANTITIES OF SEED REQUIRED IN GARDEN AND FIELD CULTURE.

Artichoke, French, 1 ounce to 100 feet of drill ; 6 ounces to an acre.
" Jerusalem, 1 quart of tubers to 75 feet of row ; 3 bushels to an acre.
Asparagus, 2½ ounces to 100 feet of drill; 2 pounds will produce enough roots to plant an acre.
" roots, 5 x 2 feet, about 4400 plants to an acre.
Barley, broadcast, 2 to 2½ bushels to an acre.
Beans, dwarf, 1 quart to 100 feet of drill; 1¼ bushels to an acre.
" " Lima, 1 quart to 100 feet of drill; ¾ bushel to an acre.
" pole, 1 pint for 100 hills.
" " In hills, 4 x 3 feet, 10 quarts to an acre.
" " Limas, 20 quarts to an acre.
Beet, Garden, 1 ounce to 50 feet of drill ; 4 pounds to an acre.
" Mangel, 1 ounce to 100 feet of drill ; 5 pounds to an acre.
" Sugar, 1 ounce to 100 feet of drill ; 5 pounds to an acre.
Borecole, 1 ounce to 300 feet of drill ; 2 ounces to an acre ; 1 ounce will provide about 5000 plants.
Broccoli, 1 ounce to 300 feet of drill ; 2 ounces to an acre ; 1 ounce will provide about 5000 plants.
Broom Corn, in drills 10 pounds, or in hills 4 to 6 quarts to an acre.
Brussels Sprouts, 1 ounce to 300 feet of drill ; 2 ounces to an acre ; 1 ounce will provide about 5000 plants.
Buckwheat, in drills ½ bushel, broadcast 1 bushel to an acre.
Cabbage, 1 ounce to 300 feet of drill ; 2 ounces to an acre ; in frames about 6 ounces to plant an acre ; outdoors for transplanting about 10 ounces to an acre.

Carrot, 1 ounce to 100 feet of drill ; 2½ pounds to an acre.

Cauliflower, ⅓ of an ounce to 100 feet of drill ; 3½ ounces to an acre ; 1 ounce will provide about 2500 plants.

Celery, ⅓ of an ounce to 100 feet of drill ; 2 ounces to an acre ; one ounce will produce from 8000 to 15,000 plants.

Celeriac, 1 ounce to 100 feet of drill.

Chervil, 1 ounce to 100 feet of drill.

Chicory, 1 ounce to 100 feet of drill, or 4 pounds to an acre.

Chufas, or Earth Almonds, in drills, 25 pounds to an acre.

Clover, see Grasses, page 119.

Collards, 1 ounce to 300 feet of drill ; 2 ounces to an acre ; 1 ounce will provide about 5000 plants.

Corn, Field, in hills, 1 quart to 200 hills ; 7 to 9 quarts to an acre.

“ For fodder, in drills 3½ feet apart, 12 to 16 quarts to an acre.

“ In drills, for soiling, 3 bushels to an acre.

“ Kaffir, 3 to 5 pounds to an acre.

“ Rice, shelled, in hills, 2 quarts to an acre.

“ For soiling, 3 bushels to an acre, broadcast.

“ Sweet, from ¼ to ½ pint to 100 hills ; in hills 1 peck to an acre.

“ Salad, 3 ounces to 100 feet of drill.

Cress, Upland and Curled, ½ ounce to 100 feet of drill ; about 3 pounds. to the acre.

“ Water, 1 ounce will sow 16 feet square in drills ; from 2 to 3 pounds to an acre.

Cucumbers, from 1 to 2 ounces to 100 hills ; 1 to 2 pounds to an acre.

Dandelion, 1 ounce to 100 feet of drill.

Egg Plant, 1 ounce will sow 300 feet of drill or produce from 1000 to 2000 plants ; 4 ounces to an acre.

Endive, ¼ ounce will sow 100 feet of drill ; 4½ pounds to an acre.

Flax, for seed, ½ bushel per acre ; for fibre, 2 to 3 bushels per acre.

Garlic, 1 pound of bulbs to 10 feet of drill.

Gourd, 2 ounces to 100 hills.

Grasses, see page 118.

Hemp, ½ bushel to an acre.

Horse Radish Roots, 10,000 to 15,000 to an acre.

Kale, 1 ounce to 300 feet of drill ; 2 pounds to an acre ; 1 ounce will provide about 5000 plants.

Kohl Rabi, 1 ounce to 300 feet of drill ; 4 pounds to an acre.

Leek, 1 ounce to 100 feet of drill ; 4 pounds to an acre.

Lettuce, ¼ ounce to 100 feet of drill ; 3 pounds to an acre.

Martynia, ½ ounce of seed to 100 hills ; 5 pounds to an acre.
Melons, Musk, 2 ounces to 100 hills ; 4 x 4 ft. apart, 2 pounds to an acre.
" Water, 4 ounces to 100 hills ; 8 x 8 ft. apart, 3 pounds to an acre.
Mustard, broadcast, ¾ bushel to an acre.
Nasturtium, 2 ounces to 100 feet of drill ; 15 pounds to an acre.
Oats, broadcast, 2 to 3 bushels to an acre.
Okra, 2 ounces to 100 feet of drill ; 10 pounds to an acre.
Onion seed, ½ ounce to 100 feet of drill ; 4 to 5 pounds per acre.
" " for sets, 50 to 80 pounds to an acre.
" sets, small, 1 quart to 40 feet of drill ; 8 bushels to an acre.
Parsley, ½ ounce to 100 feet of drill ; 3 pounds to an acre.
Parsnips, ½ ounce to 100 feet of drill ; 3 pounds to an acre.
Peas, Cow, and Field, broadcast, 2 to 3 bushels to an acre.
" Garden, 1 to 2 pints to 100 feet of drill ; 1½ to 2 bushels to an acre.
Peanuts, Spanish, 2 bushels in pods to an acre.
" Virginia, 2 bushels in pods to an acre.
Pepper, 1 ounce will produce about 1500 plants ; 3 ounces to an acre.
Potatoes, Sweet, 500 plants to 250 to 325 feet of row.
" White, ¼ bushel of sets will plant 300 feet of row ; 8 to 10 bushels of sets in drills will plant an acre.
Pumpkins, 1 pound to from 200 to 300 hills ; 3 to 4 pounds to an acre.
Radish, 1 ounce to 100 feet of drill ; 10 to 12 pounds in drills to an acre.
Rape, Dwarf Essex, broadcast, 3 pounds to an acre.
Rice, 2 to 2½ bushels to an acre.
Rhubarb, 1 ounce of seed to 125 feet of drill ; 3½ pounds to an acre.
Rye, broadcast, 1½ bushels to an acre.
Salsify, 1 ounce of seed to 100 feet of drill ; 8 pounds to an acre.
Scorzonera, 1 ounce of seed to 100 feet of drill.
Soja or Soy bean, ½ bushel to an acre.
Sorghum, broadcast, 10 to 12 pounds to an acre.
Spinach, 1 ounce to 100 feet of drill ; 8 pounds to an acre.
" broadcast, 30 pounds to an acre.
Spurry, 15 pounds to an acre.
Sugar Cane, 3 to 5 pounds to an acre.
Summer Savory, 1 ounce to 500 feet of drill ; 2 pounds to an acre.
Sunflower, Mammoth Russian, 8 pounds to an acre.
Squash, Summer, 4 ounces to 100 hills ; 3 pounds to an acre.
" Fall and Winter, 8 ounces to 100 hills ; 3 to 4 pounds to an acre.
Tares, Spring, or Vetch, in drills ; 1 bushel to an acre.
Teosinte, 3 pounds to an acre, in drills 3½ to 4 feet apart.
Tobacco, 1 ounce to 5000 plants ; 2 ounces to an acre.

Tomato, 1 ounce of seed will produce from 3000 to 4500 plants; 2 ounces to an acre.

Turnip, 1 ounce to 200 feet of drill; 2 pounds to an acre; broadcast, 1 pound to an acre.

Vetch Common Kidney, 1 bushel to an acre.

“ Hairy; 1 bushel to an acre.

Wheat, broadcast, 1½ to 2 bushels; in drills, 1¼ bushels to an acre.

## TIME REQUIRED FROM PLANTING UNTIL GARDEN CROPS ARE READY FOR USE.

Averages from the trial records of Fordhook Farms.

| | *Days.* |
|---|---|
| Artichoke, French, | 120 to 130 |
| Asparagus, (from 2 year old roots in bearing), one year | |
| Beans, Dwarf, Snap, | 43 to 60* |
| “ “ Shell, | 60 to 70* |
| “ “ Lima, | 78 to 90 |
| “ Pole, | 110 to 120 |
| Beet, Garden, | 60 to 85 |
| (According to condition of soil and season.) | |
| Borecole or Kale, | 100 to 130 |
| Broccoli, | 120 to 145 |
| Brussel Sprouts, | 140 to 150 |
| Cabbage, Early, | 100 to 110 |
| “ Late, | 140 to 160 |
| Carrot, Early, | 70 to 95 to 100 |
| “ Late, | 110 to 120 |
| Cauliflower, | 105 to 115* |
| Celery, | 140 to 160 to 175 |
| Collards, | 80 to 90 |
| Corn, Sweet, Earliest, | 55 to 75* |
| “ “ Late, | 85 to 95* |
| “ Salad, | 60 to 65 |
| Cress, | 30 to 40 |
| Cucumber, Earliest, | 50 to 55 |
| “ Main crop, | 65 to 75 |
| Egg Plant, | 145 to 160* |
| Endive, | 43 to 50 |
| Lettuce, | 40 to 60 to 65* |
| Martynia, | 60 to 80 |
| Melons, Musk, Earliest, | 90 to 100* |

| | *Days.* |
|---|---|
| Melons, Musk, Main crop, | 115 to 140* |
| “ Water, Main crop, | 120 to 140* |
| Okra, | 90 to 105 |
| Onions, Earliest, | 100 to 110* |
| “ Main Crop, | 130* to 160* |
| Parsnips, | 125 to 140 |
| Peas, Earliest, | 49 to 60 |
| “ Main Crop, | 65 to 88 |
| Pepper, | 135 to 160* |
| Potatoes, Sweet, Earliest (From transplanting) | 80 to 95 |
| “ Sweet, Main Crop (From transplant'g) | 100 to 120 |
| “ White, Earliest, | 85 to 100 |
| “ Medium Late, | 95 to 120 |
| “ Late, | 120 to 135 |
| Pumpkins, | 105 to 120 |
| Radish, Earliest, | 18 to 22 |
| “ Later sorts, | 25 to 45 |
| Salsify, | 130 to 140 |
| Spinach, | 21 to 30 |
| “ New Zealand, | 40 to 55 |
| Squash, Summer, | 55 to 65* |
| “ Winter, | 115 to 125* |
| Tomato, Earliest, | 90 to 100 |
| “ Main Crop, | 125 to 150* |
| Turnips, | 60* |

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* Maturity.

# NUMBER OF PLANTS OR TREES TO AN ACRE AT GIVEN DISTANCES.

| | *Plants.* |
|---|---|
| 1 in. × 1 in., | 6,272,640 |
| 2 “ × 2 “ | 1,568,160 |
| 3 “ × 3 “ | 696,960 |
| 3 “ × 12 “ | 174,240 |
| 4 “ × 4 “ | 392,040 |
| 4 “ × 8 “ | 196,020 |
| 4 “ × 12 “ | 130,680 |
| 5 “ × 12 “ | 104,544 |
| 6 “ × 6 “ | 174,240 |
| 6 “ × 8 “ | 130,680 |
| 6 “ × 12 “ | 87,120 |
| 8 “ × 12 “ | 65,340 |
| 9 “ × 12 “ | 58,080 |
| 10 “ × 12 “ | 52,272 |
| 12 “ × 12 “ | 43,360 |
| 12 “ × 15 “ | 34,848 |
| 12 “ × 18 “ | 29,040 |
| 12 “ × 24 “ | 21,780 |
| 12 “ × 30 “ | 17,424 |
| 12 “ × 36 “ | 14,520 |
| 12 “ × 42 “ | 12,446 |
| 12 “ × 48 “ | 10,890 |
| 12 “ × 54 “ | 9,680 |
| 12 “ × 60 “ | 8,712 |
| 15 “ × 24 “ or 2 ft., | 17,424 |
| 15 “ × 30 “ “ 2½ “ | 13,936 |
| 15 “ × 36 “ “ 3 “ | 11,616 |
| 15 “ × 42 “ “ 3½ “ | 9,953 |
| 15 “ × 48 “ “ 4 “ | 8,712 |
| 15 “ × 54 “ “ 4½ “ | 7,744 |
| 15 “ × 60 “ “ 5 “ | 6,969 |
| 18 “ × 24 “ “ 2 “ | 14,520 |
| 18 “ × 30 “ “ 2½ “ | 11,616 |
| 18 “ × 36 “ “ 3 “ | 9,680 |
| 18 “ × 42 “ “ 3½ “ | 8,297 |
| 18 “ × 48 “ “ 4 “ | 7,260 |
| 18 “ × 54 “ “ 4½ “ | 6,453 |
| 18 “ × 60 “ “ 5 “ | 5,808 |
| 20 “ × 20 “ “ 1⅔ “ | 15,681 |
| 20 “ × 24 “ “ 2 “ | 13,168 |
| 20 “ × 30 “ “ 2½ “ | 10,454 |
| 20 “ × 36 “ “ 3 “ | 8,712 |
| 20 “ × 42 “ “ 3½ “ | 7,467 |
| 20 “ × 48 “ “ 4 “ | 6,534 |
| 20 “ × 54 “ “ 4½ “ | 5,308 |
| 20 “ × 60 “ “ 5 “ | 5,227 |
| 24 “ × 24 “ “ 2 “ | 10,890 |

| | *Plants.* |
|---|---|
| 24 in. × 30 in. or 2½ ft., | 8,742 |
| 24 “ × 36 “ “ 3 “ | 7,260 |
| 24 “ × 42 “ “ 3½ “ | 6,222 |
| 24 “ × 48 “ “ 4 “ | 5,445 |
| 24 “ × 60 “ “ 5 “ | 4,356 |
| 3 ft. × 2 ft., | 7,260 |
| 3 “ × 3 “ | 4,840 |
| 3 “ × 4 “ | 3,630 |
| 3 “ × 6 “ | 2,420 |
| 3 “ × 8 “ | 1,815 |
| 3 “ × 12 “ | 1,210 |
| 4 “ × 4 “ | 2,722 |
| 4 “ × 6 “ | 1,815 |
| 4 “ × 8 “ | 1,361 |
| 4 “ × 12 “ | 907 |
| 5 “ × 5 “ | 1,742 |
| 5 “ × 6 “ | 1,452 |
| 5 “ × 8 “ | 1,089 |
| 5 “ × 12 “ | 726 |
| 6 “ × 6 “ | 1,210 |
| 6 “ × 8 “ | 907 |
| 6 “ × 12 “ | 605 |
| 7 “ × 7 “ | 888 |
| 7 “ × 8 “ | 777 |
| 7 “ × 12 “ | 518 |
| 8 “ × 8 “ | 680 |
| 8 “ × 12 “ | 453 |
| 9 “ × 9 “ | 537 |
| 9 “ × 12 “ | 403 |
| 9 “ × 18 “ | 268 |
| 10 “ × 10 “ | 435 |
| 10 “ × 18 “ | 242 |
| 10 “ × 20 “ | 217 |
| 10 “ × 24 “ | 181 |
| 10 “ × 30 “ | 145 |
| 10 “ × 36 “ | 121 |
| 10 “ × 42 “ | 103 |
| 10 “ × 48 “ | 90 |
| 10 “ × 54 “ | 80 |
| 10 “ × 60 “ | 72 |
| 12 “ × 12 “ | 302 |
| 12 “ × 15 “ | 242 |
| 12 “ × 18 “ | 201 |
| 12 “ × 20 “ | 181 |
| 12 “ × 24 “ | 151 |
| 12 “ × 30 “ | 121 |
| 12 “ × 36 “ | 100 |

## NUMBER OF PLANTS OR TREES TO AN ACRE AT GIVEN DISTANCES.—*Continued.*

| | *Plants.* | | *Plants.* |
|---|---|---|---|
| 12 ft. × 42 ft., . . . . | 86 | 20 ft. × 48 ft., . . . . | 45 |
| 12 " × 48 " . . . . | 75 | 24 " × 24 " . . . . | 75 |
| 12 " × 54 " . . . . | 67 | 24 " × 30 " . . . . | 60 |
| 12 " × 60 " . . . | 60 | 24 " × 36 " . . . . | 50 |
| 15 " × 15 " . . . . | 193 | 24 " × 42 " . . . . | 43 |
| 15 " × 20 " . . . . | 145 | 24 " × 48 " . . . . | 37 |
| 15 " × 24 " . . . . | 121 | 30 " × 30 " . . . . | 48 |
| 15 " × 30 " . . . . | 96 | 30 " × 36 " . . . . | 40 |
| 15 " × 36 " . . . . | 80 | 30 " × 42 " . . . . | 34 |
| 15 " × 42 " . . . . | 69 | 30 " × 48 " . . . . | 30 |
| 15 " × 48 " . . . . | 60 | 36 " × 36 " . . . . | 33 |
| 18 " × 18 " . . . . | 134 | 36 " × 42 " . . . . | 28 |
| 18 " × 24 " . . . . | 100 | 36 " × 48 " . . . . | 25 |
| 18 " × 30 " . . . . | 80 | 42 " × 42 " . . . . | 24 |
| 18 " × 36 " . . . . | 67 | 42 " × 48 " . . . . | 21 |
| 18 " × 42 " . . . . | 57 | 48 " × 48 " . . . . | 18 |
| 18 " × 48 " . . . . | 50 | 48 " × 54 " . . . . | 16 |
| 20 " × 20 " . . . . | 108 | 48 " × 60 " . . . . | 15 |
| 20 " × 24 " . . . . | 90 | 54 " × 54 " . . . . | 14 |
| 20 " × 30 " . . . . | 72 | 54 " × 60 " . . . . | 13 |
| 20 " × 36 " . . . . | 60 | 60 " × 60 " . . . . | 12 |
| 20 " × 42 " . . . . | 51 | | |

*Rule to Find the Number of Plants Required to Plant an Acre.*—Multiply the length by the width in feet, and see how many times the number thus obtained is contained in 43,560, the number of square feet in an acre. For instance, if plants are set 3 feet by 2 feet apart, we have, 3 feet × 2 feet = 6 square feet; 43,560 square feet divided by 6 gives 7,260, which is the number of plants required to plant an acre 3 feet by 2 feet apart.

### GRASS AND FORAGE CROPS.

| GRASSES:— | *Weight per bushel.* | *Quantity per acre.* |
|---|---|---|
| Awnless Brome (*Bromus inermis*)............ | 14 lbs. | 3 bush. or 42 lbs. |
| Bermuda (*Cynodon dactylon*)................ | 35 " | 6 to 8 " |
| Creeping Bent (*Agrostis stolonifera*)........ | 20 " | 2 " or 40 " |
| Crested Dogstail (*Cynosurus cristatus*) in mixture .................................. | 21 " | 25 " |
| Darnel-Leaved or Rye Fescue (*Festuca loliacea*)........ ............................ | .. | 40 " |
| East India or Pearl Millet................. | 48 " | 10 " |
| English or Perennial Rye (*Lolium perenne*). | 24 " | 72 " |
| Fowl Meadow (*Poa serotina*) mix with Red Top | 12 " | 6 " |
| Golden or German Millet (*Panicum miliaceum var.*).................................. | 50 " | 50 " |

## GRASS AND FORAGE CROPS.—*Continued.*

| GRASSES:— | *Weight per bushel.* | *Quantity per acre.* |
|---|---|---|
| Hard Fescue (*Festuca duriuscula*) about | 12 lbs. | 30 lbs. |
| Herd or Red Top (*Agrostis vulgaris*) | 14 “ | 42 “ |
| Hungarian Millet (*Panicum germanicum*) | 48 “ | 48 “ |
| Italian Rye (*Lolium italicum*) | 20 “ | 60 “ |
| Johnson (*Sorghum halapense*) | 25 “ | 25 “ |
| Kentucky Blue (*Poa pratensis*) | 14 “ | 35 “ |
| Lawn, Burpee's Fordhook Finest | 20 “ | 60 to 80 “ |
| Meadow Fescue (*Festuca pratensis*) | 22 “ | 40 “ |
| Meadow Foxtail (*Alopecurus pratensis*) about | 7 “ | 25 “ |
| Meadow Soft or Velvet (*Holcus lanatus*) | 7 “ | 25 “ |
| Mixture for Permanent Pasture | 14 “ | 42 “ |
| Orchard (*Dactylis glomerata*) | 14 “ | 42 “ |
| Red or Creeping Fescue (*Festuca rubra*) | 14 “ | 28 “ |
| Red Top (see Herd Grass) | .. | .. |
| Rhode Island Bent (*Agrostis canina*) | 14 “ | 28 “ |
| Rough Stalked Meadow (*Poa trivialis*) | 14 “ | 35 “ |
| Sheep Fescue (*Festuca ovina*) about | 12 “ | 30 “ |
| Sweet Vernal—True Perennial—(*Anthraxanthum odoratum*) | 10 “ | 25 “ |
| Tall Meadow Fescue (*Festuca elatior*) | 14 “ | 42 “ |
| Tall Meadow Oat (*Avena elatior*) | 10 “ | 50 “ |
| Timothy or Herd Grass (*Phleum pratense*) | 45 “ | 15 “ |
| Various Leaved Fescue (*Festuca heterophylla*) | 14 “ | 42 “ |
| Wood Meadow (*Poa nemoralis*) | 14 “ | 28 “ |
| Yellow Oat (*Avena flavescens*) | 7 “ | 25 “ |
| CLOVER, ETC:— | | |
| Alfalfa or Lucerne (*Medicago sativa*) | 60 “ | 20 to 30 “ |
| Alsike or Swedish Hybrid Clover (*Trifolium hybridum*) | 60 “ | alone 8 to 12 “ |
| Bokhara Clover (*Melilotus leucantha*) | 60 “ | 30 to 60 “ |
| Crimson or Scarlet Clover (*Trifolium incarnatum*) | 60 “ | alone 15 “ |
| Japan Clover (*Lespedesa striata*) about | 18 “ | 12 “ |
| Mammoth Red or Pea Vine Clover (*Trifolium pratense perenne*) | 60 “ | alone 15 “ |
| Medium Red (*Trifolium pratense*) | 60 “ | 15 to 20 “ |
| Sainfoin (*Onobrychis sativa*) (unshelled) | 24 “ | 48 “ |
| Soja Bean | 60 “ | 30 “ |
| Vetch, Sand or Hairy (*Vicia villosa*) | 60 “ | 60 “ |
| Vetch, Common Kidney (*Anthyllis vulneraria*) | 60 “ | 60 “ |
| White Clover (*Trifolium repens*) | 60 “ | 12 to 15 “ |
| Yellow Trefoil or Hop Clover (*Medicago lupulina*) | 60 “ | 18 “ |

## WEIGHTS OF AGRICULTURAL AND OTHER COMMODITIES.

| | *Pounds per bushel.* |
|---|---|
| Apples, | about 48 |
| “ Dried, | 22 |
| Artichoke, Jerusalem, | about 60 |
| Ashes, Wood, | about 48 |
| Barley, (Penna. 47) | 48 |
| Beans, Dwarf, Pole, and Lima, | 60 |
| Beets, | 55 |
| Bran, | 20 |
| Broom Corn, | 46 |
| Buckwheat, | 48 |
| Canary Seed, | 60 |
| Carrots, | 55 |
| Castor Beans, (Ricinus), | 46 |
| Charcoal, | 22 |
| Chestnuts, | 50 to 56 |
| Chufas, | about 44 |
| Clovers, see page 119. | |
| Coal, Anthracite, | 80 |
| Corn, Pop, | 56 |
| “ Sweet, Shelled, | about 48 |
| “ Field, on ear, | 70 |
| “ “ Shelled, | 56 |
| “ Meal, | 50 |
| Cotton Seed (Sea Island 40) | 30 |
| Cranberries, | 40 |
| Durra and Kaffir Corn, | about 50 |
| Flaxseed, | 56 |
| Hair, Plastering, | 8 |
| Hemp, | 44 |
| Hickory Nuts, | 60 |
| Hungarian Grass, | 48 |
| Lime,* Building, | 70 |
| Lime, Land, | 80 |
| Malt, | 38 |
| Millet, Golden or German, | 50 |

| | *Pounds per bushel.* |
|---|---|
| Millo, Maize, | 50 |
| Oats, | 32 |
| Onions, (Penna. 50) | 54 |
| Osage Orange, | 33 |
| Parsnips, | 55 |
| Peaches, | about 40 |
| “ Dried, | 28 |
| Peach Pits, | 48 |
| Peanuts, White and Red, | 22 |
| “ Spanish, | 24 |
| Peas, Canada, Cow, Field, and Smooth Garden, | 60 |
| Peas, Wrinkled, | 56 |
| Potatoes, Sweet, | 56 |
| “ White, | 60 |
| Pumpkin, Common Field, | about 28 |
| Rape, | 50 |
| Rye, | 56 |
| Sainfoin, | 20 |
| Salt, Coarse, | 50 |
| “ Fine, | 56 |
| Shellbarks, | 60 |
| Soja Beans, | 60 |
| Sorghum, | 50 |
| Spinach Seed, | 38 |
| Squash Seed, Winter, | about 38 |
| Sugar Cane, | 50 |
| Sunflower, | about 24 |
| Tares or Vetches, | 60 |
| Turnips, | 58 |
| Vetches, | 60 |
| Walnuts, Black, | 60 |
| Wheat, | 60 |

*Bordeaux Mixture :—*

| | | |
|---|---|---|
| Copper sulphate, | pounds | 6 |
| Fresh caustic lime, | “ | 4 |
| Water, | gallons | 22 |

In a barrel that will hold 45 gallons dissolve the copper sulphate, using eight or ten gallons of water, or as much as may be necessary for the purpose. In a tub or half barrel slake the lime. When completely slaked add enough water to make a creamy whitewash. Pour this slowly into the barrel containing the copper sulphate solution, using a coarse gunny sack stretched over the head of the barrel for a strainer. Finally, fill the barrel half full of water, stir thoroughly, and the mixture is ready for use. The 50 or 60 gallon formula is made in the same way except that 50 or 60 gallons of water is added instead of 22 gallons.

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* In many parts of Pennsylvania the practice of the trade is to sell building Lime at 75 pounds to the bushel.

*Corrosive Sublimate Solution*:—

| | | |
|---|---|---|
| Corrosive sublimate, | ounces | 2¼ |
| Water, | gallons | 15 |

This solution is used for potato scab. The corrosive sublimate is dissolved in about two gallons of hot water, and after an interval of ten or twelve hours diluted with 13 gallons of water. The potatoes to be planted are immersed in the solution for one and one-half hours, after which they are spread out to dry, then cut and planted as usual. A half barrel is a convenient receptacle for the solution. The potatoes may be put into a coarse sack and suspended in the liquid, first washing the tubers. Corrosive sublimate is very poisonous and should be kept out of the way of children and animals. All treated tubers should be planted or destroyed.

*Kerosene Emulsion.*—This is specially adapted to sucking insects, including plant bugs, plant-lice, scale insects, thrips, and plant-feeding mites. The kerosene and soap emulsion is prepared as follows:—

| | | |
|---|---|---|
| Kerosene, | gallons | 2 |
| Whale-oil soap (or 1 quart soft soap), | pound | ½ |
| Water, | gallon | 1 |

Dissolve the soap in boiling water, and add the hot solution, away from the fire, to the kerosene. Agitate violently for five minutes by pumping the liquid back upon itself with a force pump until the mixture assumes the consistency of cream. Well made, the emulsion will keep indefinitely, and should be diluted only as wanted for use.

In limestone or hard-water regions it is best to use the milk emulsion.

| | | |
|---|---|---|
| Kerosene, | gallons | 2 |
| Milk (sour), | " | 1 |

Heating is unnecessary; churn as in the former case for three to five minutes, or until a thick buttery consistency results. Prepare the milk emulsion from time to time for immediate use.

## RAIN-FALL AND SNOW OF THE UNITED STATES.

*Annual and Seasonal Averages, Seasonal Variations and Cubic Miles for each State.*

| | Area in Square Miles. | Spring. | Summer. | Autumn. | Winter. | Annual. | Seasonal Variation. | Cubic Miles. |
|---|---|---|---|---|---|---|---|---|
| | | Ins. | Ins. | Ins. | Ins. | Ins. | Ins. | |
| Alabama, . . . . . . . . . . | 52,250 | 14.9 | 13.8 | 10.0 | 14.9 | 53.6 | 1.5 | 44.2 |
| Arizona, . . . . . . . . . . | 113,020 | 1.3 | 4.3 | 2.2 | 3.1 | 10.9 | 3.3 | 19.4 |
| Arkansas, . . . . . . . . . . | 53,850 | 14.3 | 12.5 | 11.0 | 12.8 | 50.6 | 3.9 | 42.5 |
| California, . . . . . . . | 158,360 | 6.2 | 0.3 | 3.5 | 11.9 | 21.9 | 40.0 | 54.9 |
| Colorado, . . . . . . . . . . | 103,925 | 4.2 | 5.5 | 2.8 | 2.3 | 14.8 | 2.4 | 24.2 |
| Connecticut, . . . . . | 4,990 | 11.1 | 12.5 | 11.7 | 11.5 | 46.8 | 1.1 | 3.6 |
| Delaware, . . . . . . . . . . | 2,050 | 10.2 | 11.0 | 10.0 | 9.6 | 40.8 | 1.1 | 1.3 |
| District of Columbia, . . . | 70 | 11.0 | 12.4 | 9.4 | 9.0 | 41.8 | 1.4 | 0.04 |
| Florida, . . . . . . . . . . . | 58,680 | 10.2 | 21.4 | 14.2 | 9.1 | 54.9 | 2.4 | 51.0 |
| Georgia, . . . . . . . . . | 59,475 | 12.4 | 15.6 | 10.7 | 12.7 | 51.4 | 1.5 | 48.2 |
| Idaho, . . . . . . . . . . . | 84,800 | 4.4 | 2.1 | 3.6 | 7.0 | 17.1 | 3.3 | 22.7 |
| Illinois, . . . . . . . . . . | 56,650 | 10.2 | 11.2 | 9.0 | 7.7 | 38.1 | 1.5 | 34.0 |
| Indiana, . . . . . . . . . . | 36,350 | 11.0 | 11.7 | 9.7 | 10.3 | 42.7 | 1.2 | 24.2 |
| Indian Territory, . . . . . | 31,400 | 10.6 | 11.0 | 8.9 | 5.7 | 36.2 | 1.9 | 17.7 |
| Iowa, . . . . . . . . . . . . | 56,025 | 8.3 | 12.4 | 8.1 | 4.1 | 32.9 | 3.0 | 28.8 |
| Kansas, . . . . . . . . . . . | 82,080 | 8.9 | 11.9 | 6.7 | 3.5 | 31.0 | 3.4 | 40.0 |
| Kentucky, . . . . . . . . . | 40,400 | 12.4 | 12.5 | 9.7 | 11.8 | 46.4 | 1.3 | 29.3 |
| Louisiana, . . . . . . . | 48,720 | 13.7 | 15.0 | 10.8 | 14.4 | 53.9 | 1.4 | 41.6 |
| Maine, . . . . . . . . . . . | 33,040 | 11.1 | 10.5 | 12.3 | 11.1 | 45.0 | 1.2 | 23.2 |
| Maryland, . . . . . . . . | 12,210 | 11.4 | 12.4 | 10.7 | 9.5 | 44.0 | 1.3 | 8.3 |
| Massachusetts, . . . . . . . | 8,315 | 11.6 | 11.4 | 11.9 | 11.7 | 46.6 | 1.0 | 5.9 |
| Michigan, . . . . . . . . . | 58,915 | 7.9 | 9.7 | 9.2 | 7.0 | 33.8 | 1.4 | 31.3 |
| Minnesota, . . . . . . . . . | 83,365 | 6.5 | 10.8 | 5.8 | 3.1 | 26.2 | 3.5 | 34.4 |
| Mississippi, . . . . . . . . . | 46,810 | 14.9 | 12.6 | 10.1 | 15.4 | 53.0 | 1.5 | 38.8 |
| Missouri, . . . . . . . . . . | 69,415 | 10.0 | 12.4 | 9.1 | 6.5 | 38.0 | 1.9 | 41.2 |

RAIN-FALL AND SNOW OF THE UNITED STATES.—*Continued.*

| | Area in Square Miles. | Spring. Ins. | Summer. Ins. | Autumn. Ins. | Winter. Ins. | Annual. Ins. | Seasonal Variation. Ins. | Cubic Miles. |
|---|---|---|---|---|---|---|---|---|
| Montana, . . . . . . . . . . | 146,080 | 4.2 | 4.9 | 2.6 | 2.3 | 14.0 | 2.1 | 32.1 |
| Nebraska, . . . . . . . . | 77,510 | 8.9 | 10.9 | 4.9 | 2.2 | 26.9 | 5.0 | 32.9 |
| Nevada, . . . . . . . . . . | 110,700 | 2.3 | 0.8 | 1.3 | 3.2 | 7.6 | 4.0 | 14.4 |
| New Hampshire, . . . . . . | 9,305 | 9.8 | 12.2 | 11.4 | 10.7 | 44.1 | 1.2 | 6.3 |
| New Jersey, . . . . . | 7,815 | 11.7 | 13.3 | 11.2 | 11.1 | 47.3 | 1.2 | 5.6 |
| New Mexico, . . . . . . . . | 122,680 | 1.4 | 5.8 | 3.5 | 2.0 | 12.7 | 4.1 | 24.5 |
| New York, . . . . . . . . | 49,170 | 8.5 | 10.4 | 9.7 | 7.9 | 36.5 | 1.3 | 28.3 |
| North Carolina, . . . . . . . | 52,250 | 12.9 | 16.6 | 12.0 | 12.2 | 53.7 | 1.4 | 44.2 |
| North Dakota, . . . . | 70,795 | 4.6 | 8.0 | 2.8 | 1.7 | 17.1 | 4.7 | 19.1 |
| Ohio, . . . . . . . . . . . . | 41,060 | 10.0 | 11.9 | 9.0 | 9.1 | 40.0 | 1.3 | 25.7 |
| Oregon, . . . . . . . . . . | 96,030 | 9.8 | 2.7 | 10.5 | 21.0 | 44.0 | 7.8 | 66.7 |
| Pennsylvania, . . . . . . . | 45,215 | 10.3 | 12.7 | 10.0 | 9.5 | 42.5 | 1.3 | 30.2 |
| Rhode Island, . . . . . . . . | 1,250 | 11.9 | 10.7 | 11.7 | 12.4 | 46.7 | 1.2 | 0.8 |
| South Carolina, . . . . . . . | 30,570 | 9.8 | 16.2 | 9.7 | 9.7 | 45.4 | 1.7 | 21.6 |
| South Dakota, . . . . . . | 77,650 | 7.2 | 9.7 | 3.5 | 2.5 | 22.9 | 3.9 | 28.1 |
| Tennessee, . . . . . . . . . | 42,050 | 13.5 | 12.5 | 10.2 | 14.5 | 50.7 | 1.4 | 33.4 |
| Texas, . . . . . . . . . . . | 265,780 | 8.1 | 8.6 | 7.6 | 6.0 | 30.3 | 1.4 | 127.0 |
| Utah, . . . . . . . . . . . . | 84,970 | 3.4 | 1.5 | 2.2 | 3.5 | 10.6 | 2.3 | 14.3 |
| Vermont, . . . . . . . . . . | 9,565 | 9.2 | 12.2 | 11.4 | 9.3 | 42.1 | 1.3 | 6.1 |
| Virginia, . . . . . . . . . | 42,450 | 10.9 | 12.5 | 9.5 | 9.7 | 42.6 | 1.3 | 28.6 |
| Washington, . . . . . . . . | 69,180 | 8.6 | 3.9 | 10.5 | 16.8 | 39.8 | 4.3 | 43.4 |
| West Virginia, . . . . . . . | 24,780 | 10.9 | 12.9 | 9.0 | 10.0 | 42.8 | 1.4 | 16.6 |
| Wisconsin, . . . . . . . . . | 56,040 | 7.8 | 11.6 | 7.8 | 6.2 | 32.5 | 2.2 | 28.7 |
| Wyoming, . . . . . . . . . | 97,890 | 4.3 | 3.5 | 2.2 | 1.6 | 11.6 | 2.7 | 17.9 |
| Total, . . . . . . . . . | 2,985,850 | | | | | | | 1,407.14 |
| Average, . . . . . . | | 9.2 | 10.3 | 8.3 | 8.6 | 36.3 | 3.0 | 28.72 |

The average rainfall and snow of all stations, by States, gives for the spring, 9.2 inches; for summer, 10.3 inches; for autumn, 8.3 inches; and for winter, 8.6 inches, and a total for the year of about 36 inches. It appears that the rainfall over the United States generally is quite evenly distributed through the year, varying in total amount for the seasons from 10.3 for summer to 8.3 for autumn. The spring and summer rainfalls are the highest; other things being equal the rainfalls of spring, and, next to that, of summer are the most useful for agricultural operations.

With the depth given it is not difficult to get the average total rainfall for the entire United States (excluding Alaska, where we have not sufficient information). For this purpose we may take the average for each State and multiply it by the area of the state, including water surfaces.

Adding these together we get 1,407 cubic miles as the average annual total of water which descends in rain or snow in the United States. The figures for the areas are taken from the census for 1890. The annual depth of rainfall which this gives is 29 inches, or less than that given by the other method. This is to be expected, as the other method gave equal weight to each political division, and these divisions are generally smaller in the regions of greater rainfall.

To get some conception of this enormous mass of water we may compare it with the contents of the Great Lakes, and an approximate comparison is near enough. Lake Ontario is about 200 miles long and 70 broad, and its average depth is about 40 fathoms, (a fathom is a length of six feet). It, therefore, contains about 636 cubic miles of water. The annual rainfall would fill it two times and leave something over for a third time. Lake Michigan is about 310 by 70 miles, and has an average depth of about 50 fathoms, and consequently contains about 1,233 cubic miles of water. The average annual rainfall would fill Lake Michigan and leave 174 cubic miles over. Four years of rainfall would probably be enough to fill all the Great Lakes.

The amount of mechanical work which the raising of this involves is enormous, and ordinary conception of it quite inadequate. Some idea of it can be reached as follows: One inch of rain per acre makes 22,624 gallons, which equals 226,613 pounds. On a square mile the inch of water would weigh 72,516.4 tons (of 2000 pounds each). A cubic mile of water would be this weight × 5,280 × 12 = 4,593,639, 104 tons, or if the average temperature is a little above 39° F., = 4,500,000,000 tons. The total weight of our rainfall (excluding

Alaska) would be this multiplied by 14.07. This gives the enormous quantity of 6,332,000,000,000 tons. Let us take as a unit of handy measurement the weight of one of the lakes, say Ontario—636 cubic miles. A cubic mile of water weighs 4,500,000,000 tons. Hence, Ontario weighs 2,862,000,000,000 tons. Our average rainfall, weighing 6,332,000,000,000 tons, is therefore 2.2 Ontarios. The rain descends from clouds which average half a mile in height, and in raising the water to this height before falling, nature must perform the work of lifting 3,166,000,000,000 tons one mile per year, or 1.1 Ontarios. This in work per day is nearly 9,000,000,000 tons lifted one mile, and reduces to something like a lift of 100,000 tons per second. A ton lifted one mile per second is 19,200 horse power. The work done by nature, therefore, in raising the rainfall to the clouds is equivalent to 100,000 × 19,200 horse power, or 1,920,000,000 continuous horse power, or the work of 5,000,000,000 horses working ten hours a day —perhaps a thousand times as many horses as there are in the United States.

From Bulletin C., Weather Bureau, United States Department of Agriculture.

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